THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—18TH YEAR. SYDNEY, SATURDAY, OCTOBER 10, 1931. No. 15.

Table of Contents

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES— PAGE.

Listerian Oration—"Lister's Early Bacteriological Researches and the Origin of His Antiseptic System," by SIR CHARLES MARTIN, M.D., D.Sc., F.R.S. 437

"Chronic Tonsillitis and Its Surgical Treatment," by R. GRAHAM BROWN, F.R.A.C.S. 444

REPORTS OF CASES—

"Carcinoma of Cervix Uteri in Youth and Extreme Old Age," by ROLAND BEARD, M.C., M.B., B.S., F.R.C.S., F.R.A.C.S. 452

"Primary Kidney Injury, Apparently Due to Lead," by S. F. MCDONALD, M.D., M.R.C.P. 453

"Fibro-Sarcoma of the Neck," by R. M. GLYNN, M.B., B.S., F.R.C.S. 454

"Removal of Clinical Thermometer (Half Minute) from the Bladder by Manual Manipulation," by ARCHIE ASPINALL, M.B., Ch.M., F.R.A.C.S. 454

REVIEWS—

Progress in Obstetrics and Gynæcology 454
The Manikin in Obstetrics 455
Lectures on Social Life 455
An Introduction to Psychology 455
Laboratory Procedure in Diagnosis 456

NOTES ON BOOKS, CURRENT JOURNALS AND NEW APPLIANCES—

The Mayo Clinic 456
A Study of Hair 456

LEADING ARTICLES—

The Australasian Medical Publishing Company, Limited 457

CURRENT COMMENT—

Functional Disorders of the Colon 458
Pituitary Dysfunction 459

ABSTRACTS FROM CURRENT MEDICAL LITERATURE— PAGE.

Physiology 460
Biological Chemistry 461

BRITISH MEDICAL ASSOCIATION NEWS—

Scientific 462
Nominations and Elections 465

AUSTRALASIAN MEDICAL PUBLISHING COMPANY, LIMITED—

Annual Meeting 465

OBITUARY—

William John Hancock 465
John Kenny 466

CORRESPONDENCE—

Trachoma and Diet 466
Snake-Bite 466
Accommodation in Animals 467
Orthopædic Surgeons 467
Puerperal Sepsis 467

PROCEEDINGS OF THE AUSTRALIAN MEDICAL BOARDS—

Tasmania 468

NOTICE 468

DIARY FOR THE MONTH 468

MEDICAL APPOINTMENTS 468

MEDICAL APPOINTMENTS VACANT, ETC. 468

MEDICAL APPOINTMENTS: IMPORTANT NOTICE 468

EDITORIAL NOTICES 468

Listerian Oration.[1]

LISTER'S EARLY BACTERIOLOGICAL RESEARCHES AND THE ORIGIN OF HIS ANTISEPTIC SYSTEM.

By SIR CHARLES MARTIN, M.D., D.Sc., F.R.S.

IT will soon be as difficult to say anything fresh about Lister as it is for successive Harveian orators to find something yet unsaid about William Harvey. Nevertheless, as I was in early life a humble colleague of Lister at King's College, London, and later directed for nearly thirty years an institute which bears his name and which owed its inception largely to his efforts, it seemed appropriate that I should choose for my discourse some aspect of Lister's life and work.

I have chosen for my subject Lister's early bacteriological work and the origin of the antiseptic system.

The triumphant results of antiseptic surgery have been the theme of many addresses, but the interrelation between his bacteriological and surgical researches has been less adequately dealt with. Lister's experiments in his wards and in his laboratory were complementary; the two studies formed part of one organic whole. Incidentally, whilst searching for an interpretation of his observations upon wound infections, he made discoveries which formed part of the foundation on which bacteriology has been built. My title, however, is misleading if it suggests that Lister discovered how to prevent wound infection because he was a bacteriologist. It would be truer to say that he became a bacteriologist because he found out how to avoid wound infection.

[1] Delivered at a meeting of the South Australian Branch of the British Medical Association on June 24, 1931.

It has doubtless been a cause of wonderment to others besides myself that Lister alone of our profession[1] seized the significance for surgery of Pasteur's researches on putrification. Pasteur's researches were well known, as they had been advertised throughout Europe by the spirited controversy over spontaneous generation, in which he was one of the protagonists. Their application seems so obvious now, but that is no doubt because we, who have inherited the knowledge accumulated during the last sixty years, find it impossible to realize the mental background of the surgeons of 1865. In order to discover why the application was obvious to Lister and not to others, we will pause to consider what may have been the attributes and content of his mind at that time which distinguished it from those of his colleagues. Lister was endowed with a fine intellect, which was refined and sharpened by his early training and by ten years of experimental research in physiology. He was always curious as to the nature of things; he had an abundant but well disciplined imagination which led him to ask the right question, and he could devise the right experiments to secure an answer. He was also singularly free from intellectual prejudices and alert to detect error either in his facts or reasoning.

I doubt, however, whether it was intellectual preeminence which accounted for the fact that only Joseph Lister saw the application of Pasteur's work. There were many men of great intellect amongst his contemporaries and we must, I think, seek another explanation. That it was a matter of chance may be set aside, for as Pasteur once said: "In the realm of observation chance only favours the mind prepared."

I hope to be able to show that the mind of Lister was so well prepared by his ponderings and experiments that, directly he read Pasteur's papers, he realized that they supplied the clue for which he had been looking. In the evening of his life it was difficult to induce Lister to talk about the origin and development of his views on antisepsis. He seemed bored with the subject, although ready enough to discuss his researches on physiology and bacteriology. These he seemed to regard as intellectual achievements of a higher order. The succeeding paragraphs indicate, however, as nearly as I could gather, the way his thoughts on the nature of wound infection gradually shaped themselves.

At first he did not question the view of Gay Lussac, and of Liebig, that fermentation and putrefaction were due to oxidation of unstable organic molecules. This theory was the one generally accepted, and seemed to explain why subcutaneous injuries repaired without complications and an open wound suppurated. From first entering the surgical ward he was not merely horrified by the inflammation and suppuration which surrounded him, but curious as to what might be their causes. At the time, these unfortunate results of surgical interference were commonly regarded as unavoidable, and the anxiety of a surgeon was allayed when there was a good flow of laudable pus from the wound. Even when a dresser, he was not content to accept the view that suppuration was inevitable. He argued that as subcutaneous injuries with destruction of tissue and extravasation of blood underwent repair without fever and formation of pus, suppuration was clearly in some way associated with openness, and the fact that an incised wound did occasionally heal by first intention did not for some while make him suspicious of its adequacy. It was not until he observed that cases of general emphysema after puncture of the lung by a broken rib did not suppurate that he realized that the oxygen theory was untenable. Why air that had passed through the small bronchi should be deprived of the pernicious effect of outside air he was at a loss to understand. An explanation was not forthcoming until 1876, when Tyndall's experiments on the floating matter in the air in relation to putrefaction and infection were published. Early in his career Lister evidently had the notion that wound diseases might be due to infection from without, for when a house surgeon at University College Hospital, he searched for "fungi" in the purulent discharges from wounds and in the scrapings from wounds affected with hospital gangrene. The reason he looked for evidences of the growth of fungi was presumably because, at that time, they were the only lower forms of life known to infect the body, and had been shown to be responsible for favus, thrush and ringworm. His microscopical scrutiny was unavailing. It was not until twenty-five years later that special methods for staining bacteria which differentiated them from the tissues and cell *débris* were introduced, or it is not impossible that Lister, who was an accomplished microscopist, would have anticipated Ogsten's discovery of staphylococci in pus by thirty years.

The conclusions Lister had arrived at by the time he left University College Hospital in 1854 were: (i) that the cause of wound diseases was putrefaction of the discharges, (ii) that the cause of putrefaction was not the air as such, but something introduced with the air or, at any rate, from the outside world. If Lister had known of Schwann's experiments, which were published in 1837, antiseptic surgery would likely have been antedated ten years.

A research on inflammation, begun by Lister shortly after he went to Edinburgh, contributed towards his readiness to grasp the true explanation of wound diseases as soon as the clue was supplied. He was moved to undertake the experimental study of inflammation in the first instance because, when he came to teach the subject to his class, he realized that there was little real knowledge as to what indeed happened.

Inflammation had been much studied, but most of the investigations hitherto had been concerned with the end result of the reaction, and it occurred to Lister that observations of the events from the beginning would be likely to be more illuminating. To this end he watched under the microscope what happened in the transparent structure of the web

[1] Pasteur had in mind the possibility that diseases of man, like diseases of beer, were due to infection by specific germs, but as he was innocent of pathology his idea was necessarily vague.

of the frog and the wing of a bat when irritants of varying potency were applied. His technique was beautiful, and by a series of ingenious experiments he succeeded in differentiating the happenings which were due to direct action of the irritant upon the blood, blood vessels and surrounding tissues from the vascular responses effected through the mediation of the nervous system. This was one of the finest researches Lister made and anyone reading his papers on the early stages of inflammation in the philosophical transactions of nearly seventy-five years ago, cannot but be surprised to find how accurately and, with one exception, completely the reactions of the tissues and blood vessels in inflammation are described. It is curious that he missed noticing diapedesis of the white blood cells which had been seen by Waller twenty years earlier, was forgotten and was rediscovered by Cohnheim ten years later.

Lister concluded that the events he had watched in the frog's web represented what occurred when tissues were acted upon by a chemical irritant and that inflammation around a wound was the response to a diffusible poison produced, as he supposed, by the putrefaction of the serum exuded from the plane of incision. But, as he had failed to gain an insight into the cause of putrefaction, he felt that these researches had brought him no nearer to an understanding of the origin of wound diseases. This was not so, however, for, although an answer to the riddle had to come, not from the study of pathology, but from knowledge of phenomena of a different kind, and was furnished by Pasteur's experiments on spontaneous generation, Lister's mind had been so specifically prepared that he saw at once that it was the right answer and was ready to apply it to surgery. The demonstration by Lister that sepsis, pyæmia and hospital gangrene were prevented by measures which precluded the entrance of micro-organisms into a wound, was an impetus towards the discovery of the microbial origin of the contagious diseases of man and animals. Apart from this, his own researches into bacteriology led to results of first rate importance, and the methods he invented for their pursuit were so appropriate that many of them have hardly been improved on since. Lister, the surgeon, Cohn, the botanist, and Tyndall, the physicist, stand out as the three prominent workers in bacteriology between 1865, when Pasteur was induced to forsake the study of fermentations to investigate a disease of silkworms, and 1875, when Koch's paper on the anthrax bacillus appeared.

It will be easier to appraise the value of Lister's contributions if I briefly recapitulate the history of bacteriology up to 1865 when he entered the field as an investigator.

Sketch of Bacteriology up to 1865.[1]

Like other divisions of biology, bacteriology was at first descriptive and subsequently became experimental. As it deals with minute members of the vegetable kingdom, the birth of bacteriology was delayed until optical apparatus was devised permitting of high magnification and clear vision. Its birth dates back to about 1670, when that wonderful beadle of Delft, Anthony van Leeuvenhoek, having occupied his leisure making simple lenses capable of magnifying up to three hundred diameters, used them to observe a variety of natural objects. Amongst the materials examined by Leeuvenhoek were putrid infusions of peppercorns, fermenting sugar solutions, and scrapings from his back teeth.

Leeuvenhoek's magnifying lens had perforce a great curvature, but he reduced the disturbance due to spherical aberration by using a diaphragm with a small aperture. In consequence he had to employ an intense illumination and often used direct sunlight. At the end of the seventeenth century the opportunities for publishing scientific literature were limited, and Leeuvenhoek communicated his discoveries in a series of two hundred letters to the Royal Society of London, and on his death bequeathed a cabinet containing twenty-six of his little microscopes to the Society. Leeuvenhoek's letters are amongst our most precious possessions, together with Newton's home-made telescope and Robert Boyle's air pump, but someone purloined the microscopes about a century ago and they have never been recovered. In his later letters, Leeuvenhoek described and sketched yeasts, a leptothrix, bacilli of various sizes, staphylococci, streptococci and a spirochæte. Having no means of determining their size in fractions of an inch, he gives them in terms of the diameter of a red blood corpuscle. He described the movements of the motile forms and compared that of the larger bacilli to the motion of pikes and that of the spirochætes to eels. The smaller bacilli moved so quickly that he could not follow their individual movements. He compares the appearance to that of a swarm of flies rushing indiscriminately in all directions. Hereafter the field of bacteriology seems to have lain fallow for nearly one hundred years, whilst the microscope was gradually improved. The early microscopists described the animalcules they saw in water and various infusions, and the first classification of the monads was made by Otto Müller in 1773. This classification was improved upon by Ehrenberg in 1838.

In his early observations on bacteriology Pasteur did not worry about the botanical nomenclature of the organisms he experimented with. He was satisfied that their action was specific, and presumed that their form was constant. It was only later that he insisted upon their uniformity. When Lister began his observations on bacteria in 1865, the botanist Cohn had not turned his attention to the classification of bacteria, and there was as yet no agreement as to whether bacteria, like moulds, were pleomorphic.

Experimental bacteriology began with the discovery in 1810 by Apert, a French confectioner, that fruit, vegetables and meat could be preserved by

[1] For some of the facts included in this sketch I am indebted to Professor Bulloch's admirable chapters on the history of bacteriology in Volume I of "System of Bacteriology" published by the Medical Research Council, 1931.

heating in boiling water, provided the container was securely corked whilst still hot.

Apert's preserved products excited much interest at the *Académie des Sciences* and led the chemist Gay Lassac to make the experiments from which he concluded that oxygen was necessary to start fermentation. The prevailing explanation of fermentation and putrefaction for the next fifty years was that oxygen, in some obscure way, acted upon the fragile molecules of organic matter and caused them to break asunder. This view was current until overthrown by Pasteur, notwithstanding that Schulze demonstrated in 1836 that it was untenable. Schulze's now historic, but for long disregarded, experiment is worthy of a few minutes' attention. He took a flask, the cork of which was perforated by two glass tubes bent at right angles. The flask he half filled with an infusion of vegetables. After boiling the infusion briskly for some minutes, he connected each of the glass tubes, whilst still hot, with Mohr's triple absorption bulbs. One of the bulbs contained sulphuric acid, the other a solution of potash. Under these conditions, the infusion remained unaltered for a month, although he aspirated air through the flask daily. At the end of this time the cork was removed and putrefaction of the contents of the flask speedily occurred. In the following year Theodore Schwann, the founder of the cell theory, performed experiments similar to Schulze's. He used both infusions of vegetables, and a sugary solution, but in his experiment the air which was allowed access to the flask after the boiling was discontinued, had to traverse a spiral of glass tube which was heated to redness. When the flask was cold, the tube was then sealed up and kept under observation. Neither the sugary solution nor the infusion fermented until some months later when the cork was removed. From these experiments Schwann concluded that fermentations were not due to the air, but to the germs in it. Seventeen years later Schroeder and Dusch repeated and extended Schwann's experiments. They substituted a tube plugged with cotton wool for the heated tube. This served equally well to preserve the contents of the flask. Their experiments were an important confirmation of Schwann's interpretation, as they demonstrated that the excitants of fermentation were particulate. Schroeder and Dusch were unsuccessful in their attempts to sterilize either yolk of egg or meat by boiling, but a few years later Schroeder (1861) showed that this could be achieved by heating it in a sealed tube to 130° C. or in a Papin's digester with a few atmospheres steam pressure. Unfortunately this observation of Schroeder appears to have been lost sight of and the autoclave did not become a piece of bacteriological equipment for another twenty years. If it had, it would have saved years of work on the part of the early bacteriologists and much acrimonious discussion. For reasons that will be apparent later, repetition of the experiments of Schulze, Schwann, and Schroeder and Dusch was not always followed by the same result. Also the influence upon contemporary thought of the great conclusions to be drawn from their experiments was to a large extent annihilated by the opposition of Berzelius and Liebig. To these two famous chemists the idea that microscopical organisms could cause chemical decompositions which they were unable to perform, was fantastic. It was not until the subject was much more thoroughly investigated by Pasteur with his inimitable experimental skill, that the soundness of the conclusions of Schulze and Schwann was vindicated.

Pasteur's entry on his celebrated career as a bacteriologist was an accident. In 1857 he was Professor of Chemistry at Lille. In his class was the son of a local brewer who brewed sour beer. The youth had told his father how wise was their new professor and the brewer decided to consult Pasteur in the hope that chemistry might relieve him of his trouble. Pasteur examined the beer chemically and the sediment microscopically. The chemical examination did not afford much help beyond establishing that the beer contained an undesirable quantity of lactic acid. Pasteur noticed, however, that sourness of the beer was associated with the presence in the sediment of little oval bodies, joined in twos and threes. These bodies were distinguishable from beer yeast by their smaller size. Knowing of Caignard Latour's observations on yeasts made twenty years before, and of Latour's reasons for supposing yeasts to be responsible for alcoholic fermentation, Pasteur sowed a small quantity of the sediment from the soured beer into a solution containing sugar, ammonium phosphate and chalk. The sugar and ammonia disappeared, lactic acid appeared, and the chalk dissolved. Again, on standing, a sediment occurred, which he found to be largely composed of the same oval bodies which he had noticed in the inoculum.

The experiment could be repeated by successively seeding fresh solutions from the last. Pasteur therefore concluded that the little oval bodies, which he called lactic yeast, propagated in the solution and caused the conversion of the sugar into lactic acid. Sometimes, in the course of these experiments, butyric acid was formed as well as lactic acid. This perplexing fact led Pasteur to further discoveries. Whenever butyric acid occurred, the solution was always found to contain large motile bacilli. By a series of experiments analogous to those which led to the discovery of lactic acid bacilli, Pasteur was able to show that these large motile organisms were responsible for the butyric fermentation. Incidentally he observed that they flourished only when oxygen had been removed from the solution and perished if air was blown through it. He realized the meaning of this and discovered anaerobiasis.

Pasteur's studies on alcoholic fermentation are famous, but we are prone to forget that he had his predecessors. Having confirmed the observations of Caignard Latour and Schwann, he extended them both chemically and bacteriologically until he had supplied an answer to every criterion, and there was no doubt left that alcoholic fermentation was a product of the activity of the yeast plant.

Acetic acid fermentation was also shown by Pasteur to be brought about by a living ferment, which he called *Mycoderma aceti*. This was probably a mixed culture of yeasts and bacteria, several of which have since been found to possess the faculty of converting alcohol into acetic acid.

Interspersed with these researches on fermentations, Pasteur was engaged in the controversy upon spontaneous generation. As this played a large part in the early development of bacteriology and was in a sense the origin of the antiseptic system of surgery, it is worth while considering some of the main features of this famous scientific quarrel.

Spontaneous Generation.

The rediscovery of infusoria revived interest in the problem of the origin of life, and the question whether bacteria, like plants, had progenitors, or whether they arose by spontaneous generation, seriously occupied the minds of philosophers. At the present time we are inclined to be contemptuous of the mental capacity of these scientific men of fifty and one hundred years ago who regarded the occurrence of spontaneous generation as an open question. This is unjust. The transformation of inorganic materials into organic matter, which in due course became imbued with life, was illustrated by the growth of plants. Life on the earth presumably had a beginning, and it was conceivable that the acquisition by organic matter of the properties of self direction and self propagation might be taking place all the time and account for the origin of the small beings recently revealed by the microscope. The conception was legitimate, but it was ultimately shown that the experiments held to support it were faulty.

The spontaneous generation of vermin and insects was taken for granted by our ancestors. Aristotle was a firm believer. Virgil was convinced that bees originated from the carcass of a bull and gives in his Georgics an infallible prescription for replenishing a hive. Van Helmont is responsible for a receipt to create mice. The famous French naturalist Buffon embraced the doctrine and developed it with the aid of his powerful imagination. These larger claims of the generationists were gradually whittled down, but in the middle of the eighteenth century evidence seemed to be supplied by Needham to show that even if earth worms did not arrive *de novo*, as believed by Buffon, microscopical life originated spontaneously in putrescible liquids.

Needham's evidence was questioned by the Abbé Spallanzani on the ground that when he boiled the infusions for an hour, generation did not occur. Needham replied that Spallanzani had heated the infusions too long and had thereby destroyed the vegetative force of the infusion. He advised him to try less heat. There the matter rested until it was noisily reintroduced one hundred years later by Pouchet, the Director of the Natural History Museum at Rouen, in 1858.

Pasteur had an open mind on the subject of spontaneous generation, but realizing that Pouchet's claims undermined his work on fermentation, he felt it necessary to make a critical examination of them. By a variety of ingenious experiments he proved that putrescible materials remained unchanged indefinitely in contact with air if any means were taken to prevent the access of the germs which are present in ordinary air. He did not assume that germs were present in the air, he showed that they were, by catching them on a filter of powdered sugar. Thus was the second conclusion of Schwann vindicated, but Pasteur's experiments were by far more convincing that Schwann's. Whereas Schwann performed a few experiments, Pasteur made hundreds, and he devised further experiments to meet every objection raised. When, finally, it was objected that in all his experiments his materials had been heated, although this was not a valid objection, he, with the help of Claude Bernard, drew blood and urine into heated glass tubes, sealed them with a flame, and incubated them at 37° C. for a month. I have seen some of those tubes, and after fifty years they were unchanged. It was nearly twenty years, however, before the combat about spontaneous generation ended. It would have been neither so long nor so acrimonious if every competent experimenter could have repeated Pasteur's experiments. This was by no means the case. Tyndall was able to confirm them at Kew, but not in the laboratory of the Royal Institution in London. Tyndall found that some bacteria were more resistant to heat than others and that there were "germs" of some bacilli and developed forms, the former being more resistant to heating than the latter. He could not sterilize an infusion of dried hay by boiling for eight hours. About this time the famous German botanist, Cohn, described the process of sporulation and germination in *Bacillus subtilis* and showed that the spores were resistant to heat. After Cohn's observations Tyndall interpreted his experiments to mean that when only "developed organisms" were present in an infusion, it was readily sterilized, but if the spores preponderated, boiling for many hours might be ineffective. On this hypothesis he introduced discontinuous heating at 100° C. Tyndall's method is successful if sufficient time is allowed to elapse between each successive heating to permit the spores to develop into the vegetative form. It is still employed when sterilization in an autoclave at 120° C. is inadmissible.

It was Tyndall's experiments and the sweet reasonableness with which he expounded them which finally convinced the scientific world that spontaneous generation of bacteria was an illusion.

Tyndall got very near to the right interpretation of his perplexing experiences, but the full explanation was not forthcoming until Cohn described sporulation and germination in *Bacillus subtilis* and showed that spores were resistant to heat. This was, however, ten years after Lister began to work at bacteriology. You will no doubt have noticed that all the knowledge of bacteriology so far resumed, concerned fermentation and putrefaction. Of the relation of bacteria to disease there was

indeed but one piece of knowledge in 1865, and this was not known to Lister until some years later. Pollender had seen bacteria in the blood and spleen of animals dead of anthrax, and Davaine had shown that bacteria were present in the blood of animals suffering from this disease. He had also recorded that an animal could be infected with a drop of blood drawn from one suffering from the disease, but only when his "bacteria" were visible under the microscope.

Davaine's evidence that anthrax was caused by the bacteria he saw was not complete, but he presented a good case for it. The idea was, however, so novel that it was not generally acceptable.

The historical sketch I have just presented illustrates how meagre was knowledge at the time Lister began to study bacteria and the paucity of appropriate methods at his disposal for the pursuit of bacteriology will be emphasized if I remind you:

1. Sterilization was precarious, as the existence of heat-resisting spores was unsuspected.
2. The autoclave had not been introduced.
3. Bacterial filters had not been invented.
4. The usefulness of an incubator had not been appreciated.
5. There were no suitable methods for staining bacteria to differentiate them from the tissues and *débris* in which they were embedded.
6. The nutrient media were few and unsuitable.
7. Solid media were not yet introduced.
8. There was no proper classification of bacteria and no sure means of identifying them.
9. There was no method for obtaining a pure culture of an organism.

Lister's Bacteriological Researches.

As soon as Lister read Pasteur's papers and grasped that they afforded a probable interpretation of wound infection, his curiosity was aroused to know more about the nature, life history and distribution of germs. The demand for further knowledge became the more urgent as he proceeded to develop his system of antisepsis. In order to gain first hand knowledge on the subject, he repeated many of Pasteur's experiments and extended them, and he was soon engaged upon investigations bearing upon the germ theory to which he devoted whatever time could be spared from an active surgical career.

Most of Lister's bacteriological researches were undertaken to guide him in his surgical procedures, for the antiseptic system was one continuous experiment. They possessed, however, a wider significance than their application to surgery; they served to correct erroneous generalizations promulgated by his contemporaries and resulted in some first rate discoveries about bacteria.

In the early days of a science the great discoveries are those of method, and among Lister's notable contributions to the development of bacteriology were the methods he devised for its pursuit. His study and back kitchen were his laboratories. His apparatus was of a homely character. Wine glasses covered with watch glasses served as culture vessels. To avoid draughts, these were covered with a glass shade. Pieces of glass tubing tapered to a fine point were used to remove portions of culture for examination and for inoculation. The media he employed were infusion of turnips, urine, Pasteur's solution, and a 3% solution of lactose to which was added 10% of fresh egg white. The white of egg was skilfully extracted from hen's eggs with precautions against contamination, and filtered and mixed with the previously boiled solution of milk sugar.

Lister first heated his glassware in a Bunsen flame to sterilize it, as Pasteur had done, but as this method was often disastrous, he invented a hot air sterilizer.

This was an iron box with a hole in the top, through which a thermometer was inserted. One side of the box was detachable. The box stood upon an iron stand with four legs and three shelves. Beneath the lowest shelf a large burner was placed. The shelves prevented the hot gases from impinging upon the bottom of the box. The box and stand were completely surrounded by a rectangular cover of sheet iron, except for a hole in the top; this conserved the heat and caused the products of combustion to pass over the sides and top of the box, thus ensuring equal heating of the box.

To sterilize glassware the temperature of the box was maintained at 170° C. for half an hour. Lister's sterilization of glassware was efficient, but for media he had to depend on boiling.

The media were introduced into a flask by means of a siphon passed to the bottom of it to avoid soiling of the upper part of the flask. The siphon being removed, the neck of the flask was plugged with carbolized cotton wool and the flask inserted into a saucepan up to the neck and boiled for half an hour.

To decant his culture media he used a siphon the two legs of which were of glass and the intermediate portion of rubber tubing. One of the glass pieces was long enough to pass to the bottom of the flask, the other (shorter) was drawn out, with a bulge about one inch from the point. To avoid contamination during decantation, the following device was used. A child's hollow rubber ball was cut in two and a small central hole made in the half. The half ball was threaded on to the free end of the siphon up to the bulge, where it remained attached and formed a hemispherical shield to guard the point from microbes falling upon it during the process of decantation. The siphon, having been filled with water and boiled for half an hour in a saucepan, was clamped and removed, and the longer piece of glass passed into a flask of media, the neck of the flask plugged again with carbolized wool, the original cotton wool plug having been nimbly removed for the purpose. On lowering the other end of the siphon and loosening the clamp, the water ran out followed by the culture media. When the water had been displaced, the clamp was again tightened. To fill a number of wine glasses

with the fluid medium their covers were momentarily removed, the end of the siphon with its protective hood placed over each wine glass in turn, and the desired amount allowed to flow in. Then the watch glass was replaced.

As much of the medium as required having been decanted, the end of the siphon was raised, the medium ran back out of the tube and a piece of carbolized wool was tied over the point until again required. This is very much the technique we now employ, including the hooded pipette, only it required more dexterity to perform in Lister's time, because he had not an autoclave at his disposal. I doubt, however, whether bacteriologists are aware that Lister invented all their methods before 1870.

Subsequently Lister simplified his method of decantation and storage of culture media by the invention of a flask with a spout like that of a teapot projecting from the side of the flask. The end of this was narrowed and was bent downwards to the point. It had a bulge near the tip for securely tying a plug of cotton wool over it. The half ball was attached to the point of this, a very handy piece of apparatus, as it was to the siphon. To fill his wine glasses the flask was inclined. When it was brought back to the original angle, the liquid ran back into the flask. The drop left in the point was then sucked out with a piece of carbolized wool and the orifice protected by tying a piece around it. When the flask was wanted again to charge the glasses, the wool was removed, the point flamed and the manœuvre repeated.

By these methods Lister successfully carried out all the procedures required for bacterial culture, provided the materials of which his medium was composed did not contain heat-resistant spores. When misadventures occurred, he attributed them to want of skill in his manipulations, and it was not until Cohn described sporulation in the hay bacillus and disclosed the unexpected fact that this form of living matter would withstand heat in boiling water for hours, that the injustice of this self-condemnation was apparent.

Lister's earlier published work on bacteriology was mostly concerned with the description of various forms of microbial life which grew in his wine glasses containing various media after they had been exposed in different localities. He noticed that the flora differed when the exposure was made in his kitchen, his study, in a field or in a dairy, also that sometimes there seemed to be "an epidemic" of a particular kind of microbe in his study. The bearing of these observations on surgery was apparent to him.

For studying the growth of microbes he devised what he called a microscopical garden. This consisted of a thick glass microscope slide in which he had had ground a circular trough about half an inch in diameter and one-eighth of an inch deep. A drop of culture was placed upon the central island and covered with a cover glass that extended beyond the trough. The edges of the cover glass were sealed with wax. The object of the trough was to provide oxygen for the microbes. By making observations continuously or at frequent intervals he saw bacteria grow and divide, and determined the time taken for a generation. By means of the microscopical garden he was enabled to describe the method of reproduction of a variety of moulds, yeasts, bacilli and cocci. He was particularly interested in the cocci, which were new to him. One variety of coccus which grew best in urine, he showed to be responsible for ammoniacal fermentation. Another fact which seemed to him of great importance was discovered at this time. Bacteria sometimes grew abundantly in albuminous solution or in urine without giving rise to putrefaction. This indicated to him that sepsis was not always due to putrefaction of discharges, as he had originally imagined, but that in some cases the infecting germs might spread through the tissues without demonstrating their presence by putrefaction of the wound. Erysipelas seemed to require some such interpretation. The combination of observations in the wards and experiments in wine glasses was beginning to lead Lister very near the truth.

Another observation early made by Lister was that with his bacteriological technique sterile urine could be collected from the *meatus urinarius* and sterile milk from the lacteal duct of a cow without catheterization. This showed that neither urine nor milk had an inherent tendency to ferment, but he was puzzled to explain why the trace of secretion remaining in the ducts did not act like a train of gunpowder. That it did not do so indicated to him that contact with healthy mucous membrane in some way yet unknown exerted an influence antagonistic to bacteria.

Until a few years ago we had a flask of Lister's urine at the Lister Institute which he had collected in this way, but misadventure overtook it. It was being handled by a bacteriologist from abroad when he became overcome with emotion and dropped it.

In his first papers on bacteriological subjects Lister related observations which led him to believe that bacteria, like moulds, were so pleomorphic that it would be useless to attempt to classify them. He was led into this error because he did not then realize either that such a small inoculum as adheres to the point of a needle may nevertheless contain many varieties of microbial life or the differential effect of media upon their multiplication.

Pasteur pointed out this possible source of error to him and by further experiments Lister learned that the nature of the apparent pleomorphism depended upon the original chance seeding of the medium. This convinced him that he might likely have been misled, so he devised a crucial experiment.

In this experiment he proposed to breed from one organism only and watch developments. He argued that if a culture were sufficiently diluted, ultimately one drop would contain but one organism. The first step necessary was to find out how much it would be necessary to dilute. He accordingly devised a method for counting the organisms in a known small volume of liquid. Having found that one-

fiftieth of a minim just filled the space under a cover glass of half an inch diameter, he placed this quantity on a slide, covered it, and counted the bacteria in a number of fields. Having ascertained the area viewed in a field of his microscope, and knowing the area of the cover glass and the average number of bacteria per field, the number in one-fiftieth of a minim could be arrived at. This was the number of times he must dilute his culture in order to have an average of one bacterium per one-fiftieth of a minim.

Lister was surprised to find he had to dilute his culture about a million times. The next requirement was a micropipette with which to deliver quantities of liquid of the order of one-thousandth of a cubic centimetre with sufficient accuracy. For this purpose he adapted to the upper end of a hypodermic syringe a brass fitting with a central hole tapped with a fine thread. The stem of the piston carried a corresponding male thread, and on that portion projecting from the syringe a circular nut of about one and a half inches diameter was fixed. The nut was graduated on its periphery. By turning the nut the piston would be advanced to the desired extent, each graduation representing a delivery of one-hundredth of a minim. To the lower end of the syringe a tapering glass tube, six inches in length and drawn to a fine point, was rigidly attached. This glass end of his syringe could be readily sterilized in the flame.

The first experiment was made with a bacillus prevalent in dairies which he had previously described as *Bacillus lactis* and ascertained to clot milk readily. A culture of this organism was diluted to what he had by counting calculated to be the required degree to have an average of one bacillus in one-fiftieth of a minim. One-fiftieth of a minim of the dilution was placed in each of ten wine glasses charged with sterile milk. After a few days it so happened that five of these had clotted; the other five remained permanently fluid. In all five in which the milk clotted, the appearance of the bacillus was identical, and although sub-cultures were made every few days for upwards of a month, their form remained constant. The pleomorphism previously described was evidently a mistake, and Lister took the first opportunity to rectify his error. Although designed to control a source of error, this experiment had done much more. He had achieved a pure culture of a bacterium for the first time, and had supplied the first rigid proof that the fermentation was caused by the bacillus and not by some associated virus or hypothetical enzyme in the culture, for into all his wine glasses he had delivered the same volume of solution, but fermentation occurred only in those in which his lactic bacillus grew.

Lister did not publish many papers on bacteriology, but the few he did are full of good things, and that "on the lactic fermentation and its bearings on pathology" ranks as one of the classics in the literature on the subject. It is a pattern of clear thinking, triumphant mastery of technical difficulties, and lucidity of exposition, and I recommend its perusal to any one aspiring to become a bacteriologist. The necessity of this excursion into the realms of pure bacteriology, if he were to comprehend infection in wounds, cannot be better expressed than in one of the introductory paragraphs to this paper:

> In order that any sure steps may be taken to elucidate the real nature of the various important diseases which may be presumed to be of a fermentative nature, such as the specific fevers or pyæmia, the first essential, as it appears to me, is that we should have clear ideas, based upon positive knowledge, with regard to the more simple forms of fermentation, if I may so speak—more simple because they can be conducted and investigated in our laboratories.

I have not felt it necessary to emphasize the benefits of Lister's work to surgery, and therefore to mankind. This has been done so often and so well by others more competent to assess its value. I believe, however, that Professor Keen, of Philadelphia, correctly summarized the transformation when he said that the period of surgery before Lister was B.C. and afterwards *anno domini*.

Nor have I spoken of the charm of Lister's personality. His gentleness and benevolence have also been dwelt upon by others.

My object has been merely to indicate how it came about that this great-hearted man of science, with a passion for experimentation, discovered the nature of sepsis and was able to devise methods for its prevention.

CHRONIC TONSILLITIS AND ITS SURGICAL TREATMENT.

By R. Graham Brown, F.R.A.C.S.,
Brisbane.

Certain correspondence on chronic tonsillitis and its surgical treatment which has appeared at various times in our journal shows clearly that some of the writers, at any rate, are rather confused about certain aspects of the question. When writers, who, by the fact of their writing, are assumed to have a comprehensive knowledge of the question they are discussing, make conflicting statements, what, then, must be the outlook of the general practitioner? Therefore, in order to emphasize certain facts in connexion with the chronically inflamed tonsil and its surgical treatment, I am encouraged to present the following notes. They aim at offering some evidence of a positive nature to those who may feel the need of it, and they are meant mainly for the benefit of the general practitioner.

What is the Tonsil?

It is well that we should very clearly define what is meant when we refer to the tonsil. Developmentally the tonsils are the lateral masses of the ring of lymphoid tissue which surrounds the common opening into the respiratory and alimentary tracts. With the development of the palate the naso-pharyngeal portion becomes separated from the

tonsillar portions. Both portions are, however, identical in structure, as they are in origin. The tonsil has been described as a lymphoid-lined double pocket which develops from the *cul-de-sac* lower part of the second pharyngeal pouch, and lies between the soft palate and the tongue. Lying beneath this lymphoid tissue is a layer of deep cervical fascia, which is raised into a ridge in the region of the faucial mass, where will eventually be developed the tonsil. The lymphoid tissue masses itself on the summit of the ridge and forms the large central portion of the tonsil. A few muscle fibres, the so-called tonsillo-pharyngeus muscle, which consists of a few fibres of the lateral part of the palato-pharyngeus muscle, likewise enter into the fascia and become attached to the deep surface of the mass. Above and below are lymphoid lined pockets—the supratonsillar and infratonsillar recesses. The one above forms a hood over the central mass of the tonsil, while the lower one remains as a pocket. This lower pocket is not so evident as the upper one and is continued into the prolongation of tonsillar tissue which descends the lateral wall of the pharynx and into the portion which sweeps inwards on to the base of the tongue. These are described by some as the infratonsillar nodes, but are more correctly named the pharyngeal and lingual branches of the tonsil (Figures II and III).

Figure I.

Diagram of tonsil, after Fowler. A = hoodlike upper lobe, B = Pocket-like lower lobe, C = lymphoid mass, D = muscle attaching to capsule at equator.

Figure II.

Right tonsil removed completely, as illustrated, by expanded tonsillectomy by dissection. Viewed from the superficial or internal aspect. A = pseudo lower pole. B = true lower pole, showing pocket-like lower lobe branching into C = lingual branch. D = pharyngeal branch.

The So-Called "Capsule" of the Tonsil.

In reality the so-called "capsule" is a dense portion of the layer of deep fascia which separates the tonsil tissue from the palatal and pharyngeal muscles which form its bed. The movements of the one against the other during speech and swallowing have resulted in the production of a thickening of the fascia on the deeper surface of the tonsil and this is called the "capsule." It is freely movable, more or less, upon the looser and deeper areolar-like parts of the fascia. The so-called "capsule" is limited to the area above the original summit of the ridge of deep fascia about which the main tonsillar mass is developed and which is represented by the attachment of the small tonsillo-pharyngeus muscle (see Figures IV and V). It is here that difficulty arises in separating the tonsillar tissue covered by its "capsule" from the deeper fascia, and it is generally at this region and below that muscle or tonsil tissue or both are found on tonsils which have been enucleated with the guillotine (Figures V, VII and VIII).

Figure III.

Superficial or internal view of the left tonsil from the same patient as Figure II. A = pseudo lower pole, B = Pocket-like lower lobe, C = large lingual branch, D = large pharyngeal branch.

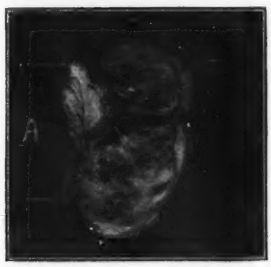

Figure IV.

A child's right tonsil removed by the reverse guillotine method. Anterior view of the tonsil as seen when removed from the ring of the guillotine. The "capsule," A, is everted. Scarring on the tonsil surface, the result of past attacks of tonsillitis, is clearly shown.

Some vessels enter and leave the tonsil at this site. The so-called "lower pole" of the tonsil is a pendulous portion of the central mass. This is clearly demonstrated in several of the accompanying

illustrations. It is not really the lower pole of the tonsil, but only apparently so in specimens which have been enucleated with the guillotine, and it is for this reason that one is so often told: "The tonsil has been removed completely in its capsule, as you can see" (Figures IV, V, VI, VII and VIII). A tonsil removed by the method of dissection, since

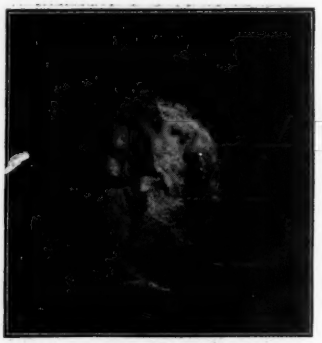

Figure V.

Anterior view of the companion left tonsil seen with the "capsule," A, replaced into its normal position. Although considered a "clean" enucleation, remains of muscle are seen attached to the equator at E.

the plane of the dissection is continued down the lateral pharyngeal wall by stripping off the fascia from the tonsil, very clearly shows its parts and particularly demonstrates the distinction between the false and true lower pole of the tonsil (Figures I, II and III).

The Plicæ.

If we regard the developed tonsil as a pocket, the edge of the orifice is guarded, except near the posterior pillar, by folds called plicæ. These are in fact the free margins of the pouch orifice. The *plica*

Figure VI.

Superficial or internal view of a tonsil enucleated with the guillotine. The supratonsillar recess, R, was packed with cotton wool during preserving in order to demonstrate more clearly the hoodlike upper lobe, L, and its disposition to the main central tonsil mass. A is "capsule."

semilunaris above and in front represents the edge of the tonsillar hood, while the *plica triangularis* below and in front is that portion of the tonsil "capsule" which extends inwards and backwards beyond the anterior pillar of the fauces. Mucous membrane covers its free surfaces. The plicæ are more or less invaded by lymphoid tissue, which fact is of surgical importance, particularly in the case of the *plica triangularis*. This latter, in its lower parts especially, is liable to become involved in thick hypertrophy of lymphoid and epithelial tissues,

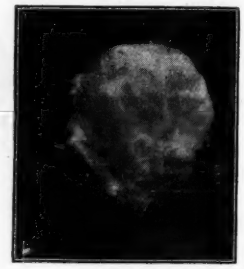

Figure VII.

View of the deep or external surface of the companion tonsil to Figure VI. Note the slight roughness at and below E, due to fine muscle fragments attached to tonsil and to the cut surface of the lower lobe.

and for this reason should be carefully examined during operation, and the involved portion, if present, should be removed.

The above simple description (which in parts is taken from Fowler's "Tonsil Surgery") should be sufficient to make it evident that the complete enucleation of the tonsil is not usually performed

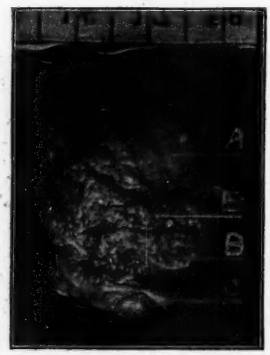

Figure VIII.

Deep or external view of a tonsil enucleated with a blunt guillotine with the "capsule" replaced to its normal position. A large amount of muscle and fibrous tissue is adherent to the specimen at E. This is an example of a tonsil which has been roughly torn out with the guillotine and is incompletely removed. A = capsule. B = lower lobe remains, indicating incomplete removal here. C = pseudo lower "pole." E = equator.

by the guillotine method of removal, and that since the inferior portions are a very potent source of focal infection, to remove them one should resort to the method of dissection. As these regions are

not generally involved to a serious degree in children, it is an explanation why the removal as a routine of the large upper mass of the tonsil only, although generally satisfactory, sometimes (and that more often perhaps than is appreciated) results in a recurrence of the diseased tonsillar state.

The Acutely Inflamed and the Infected Tonsil.

A distinction must be made between the acutely and the chronically inflamed tonsil, and likewise the infected. Obviously it would not be right to enucleate as a routine the acutely inflamed tonsil. Such a procedure, however, is sometimes to be considered in the treatment of a quinsy. In these circumstances some experts enucleate the tonsil at the time of opening the abscess (in this case the tonsil may be but slightly inflamed, for a quinsy is a peritonsillar infection). Some authorities advise and practise the removal of the tonsils during the subacute stage of inflammation in cases of acute nephritis and acute rheumatism, but this practice should not be followed, except upon the request of expert physicians who have arrived at this conclusion after very serious consideration of the particular case. Deaths have been recorded following the removal of tonsils in acutely inflamed conditions, and also when a quinsy exists, and cases of severe general infection have been reported following such proceedings.

The Chronically Inflamed and Infected Tonsil.

If a tonsil is inflamed, it must be infected; but an infected tonsil may sometimes show but little evidence of being inflamed. An endeavour is made to distinguish the two groups. Speaking generally, it is not the markedly inflamed tonsil which is the site of a focal infection, but rather the small tonsil with little signs of inflammation. This is the reason why such a type of tonsil is so frequently overlooked by the physician and general practitioner when searching for a cause of such conditions as chronic rheumatism, subacute and chronic kidney infections and so on. Writing in a general sense, it can be safely stated that all adult tonsils are infected, that after the age of five years or thereabouts the tonsils have served their useful purpose and that from that age onwards may not only fail to perform their proper function, but may actually be a menace to the individual's well-being. From the foregoing remarks it does not follow that all persons of five years of age and over should have their tonsils enucleated, but it must be emphasized that in looking for a cause of focal infection, one should inspect these structures and consider their condition most carefully.

When to Perform Tonsillectomy.

The question has often been asked: "What are the reasons upon which one decides that the tonsils should be enucleated?" Or, "How can one tell that the tonsils need enucleating?" There are certain definite conditions which indicate that the tonsils need enucleating, and these are:

In a Child.

In a child the tonsils may need enucleating for several reasons.

Enlarged Tonsils.

When the tonsils are chronically enlarged and are associated with recurrent sore throats or with clinically enlarged cervical glands or either condition exists independently, they should be enucleated. The mechanical obstruction itself may warrant their removal, but the last mentioned condition is mostly more apparent than real, for the reflex contraction of the palate which follows depression of the tongue during examination will cause the tonsils, when greatly enlarged, to meet, and will give the suggestion of a condition of almost total obstruction.

Associated with Adenoids.

When adenoids are present which need surgical attention, tonsils should be enucleated. Because the lymphoid tissue about the pharynx and the fauces is of the same nature and makes up one system, it is reasonable to suppose that inflammatory disease of one part is likely to be associated with inflammatory disease of another. Therefore, it nearly always happens that chronically inflamed adenoids (the pharyngeal or Luschka's tonsil) are associated with chronically inflamed tonsils (faucial). In fact, the one is seldom encountered without the other. Moreover, recurrence of adenoids after removal is frequently associated either with tonsils which have not been surgically interfered with, or with those which have been incompletely removed. The writer makes it a rule to remove the adenoids only in infants up to two years of age (unless some special indication exists), but to enucleate the tonsils in addition in children over that age, particularly if the patients live in towns where exposure to infection is more likely to occur than in the country.

Small Tonsils with Little or no Evident Pus.

Enucleation is indicated when the patient is the subject of rheumatism—cardiac, articular, muscular *et cetera*—or of subacute or chronic kidney disease, manifesting itself by the presence of albuminuria, hæmaturia and so on, or is the subject of attacks of acidosis with or without cyclical vomiting. With regard to hæmaturia, the writer has had several patients who have had this symptom, sometimes in a very pronounced degree, and who have sometimes been in a grave state of health. After the enucleation of their tonsils the condition has cleared up completely and the patients have remained permanently free from hæmaturia. One should remember that many patients labelled "essential hæmaturia" may belong to this class. Frequently upon the examination of a patient belonging to this "focal infection" group the tonsils may reveal nothing to indicate that the source of the focal infection resides within them. It is therefore not only justifiable but essential to enucleate the tonsils of these patients. The "acidosis" group of patients may possess tonsils which are the seat of a focal infection.

Tonsils Exuding Pus.

Enucleation is called for when the patient is the subject of gastric or intestinal disturbances due to the swallowing of pus exuding from the tonsils (teeth and nasal accessory sinuses may be the source of pus or all three be the combined source). Acidosis, with or without cyclical vomiting, may be associated with diseased tonsils of the "pus-exuding" variety as well as with those of the "focal infection" variety. Certain bronchial conditions may likewise have their origin in the inhalation of pus from suppurating tonsils.

Associated with Deafness or Running Ears, or Both.

In patients who are sufferers from chronic running ears the tonsil, because of the close proximity of its upper "pole" to the Eustachian tube, may be the cause of blocking of the Eustachian tube or even of infection of its mucous membrane, or of both. This condition may be unassociated with the presence of adenoids. Deafness likewise may have the above condition as its predisposing cause and may be unassociated with a suppurating ear.

In the Adult.

The above brief classification holds for the adult with a few modifications, due to the fact that some conditions are more common in children and others more common in adults. Rarely do we find "adenoids" in the adult and rarely the cardiac rheumatic conditions, except as relics of infection in childhood; but we find deafness, the articular and muscular rheumatisms, and debility and mental states due to a focal absorption from chronically infected tonsils.

Indications of Tonsillar Disease.

There are physical signs which help in determining whether a tonsil should be enucleated or not, and they are: (i) the presence of the faucial band of chronic injection, and (ii) evident inflamed tonsillar crypts.

The Faucial Band of Chronic Injection.

A tonsil upon inspection may show no obvious signs of being infected, but there may be a band of injection near the free edges of the pillars of the fauces on their anterior surfaces, and this, when present, is a definite indication of toxic absorption from this structure. This band varies in its width and in its depth of congestion according to the degree of absorption taking place. Upon a casual examination this congested band may be easily overlooked, but if care be taken before manipulating the tonsil, it will, if present, be apparent. In marked degrees of chronic low grade absorption a purplish band as much as 0·5 centimetre in width may be seen along the anterior surface of the anterior pillar of the fauces as well as a similar band on the posterior pillar. This sign has been mentioned first, for it is obvious that after manipulating the tonsil with instruments the whole anterior surface of the anterior pillar may then become injected and the sign in consequence destroyed.

Evident Inflamed Tonsillar Crypts.

Evident inflamed tonsillar crypts, exuding pus, may be observed either upon simple inspection or by expressing the tonsil. As has already been hinted, when obvious pus is present, the symptoms are local, inflammatory and gastric, or bronchial. The gastric symptoms may manifest themselves by gastric disturbances proper or by general debilitating conditions from absorption from the stomach or, as generally happens, both may be manifest together. In the toxic absorption variety little *débris* and pus, or either one or the other, may be obtained upon extreme expression, and the symptoms then are generally of a focal infection.

Expression of Tonsils for Evidence of Pus.

Expression of tonsils is an essential procedure and should be practised by all practitioners of tonsil surgery as well as by the general physician, and it is performed in the following way. The patient is placed (standing or seated, as is convenient) facing a good light, be it from a window or from a forehead reflecting mirror or head light. A simple right-angled (on the flat) tongue depressor is used, which has a slightly rounded edge for pressing into the palate. (A Lack's tongue depressor is a useful one; it is a simple type and is commonly used.) It is better to follow a routine in the examination and a general inspection of the tonsils and fauces should be made first. One tonsil is first expressed and then the other. It is essential to estimate correctly the depth of the tonsils, for it is usually in the deepest parts of the tonsillar crypts that the pus and *débris* are present. The constant passage of food and saliva and the movements of the palate continually "milk the tonsils," as it were, so that only in tonsils with a high degree of suppuration is pus near or on the surface. It is surprising sometimes to what depth the tonsil may extend, and no estimate can be arrived at as a result of a simple inspection by those not very familiar with tonsil surgery. Sometimes a slight bulging of the anterior aspect of the palate may indicate the position of the deeper limits of the tonsil, but the depth of this structure can be made out if the tongue depressor be turned on its side and the anterior pillar be approached, a start being made near the ascending ramus of the lower jaw and the instrument being slid gently and with slight pressure towards the tonsil. Then, by exerting a firmer pressure and continuing the manipulation towards the surface of the tonsil, the contents of its deepest parts can, in part at any rate, be expressed to the surface. In this way it is sometimes possible to turn the tonsil until it almost faces the examiner, but care must be taken not to cause the patient pain by pressing too hard.

Tonsil Cultures.

Attempts to grow organisms by culture from the fluid obtained from tonsils has been advocated by certain writers. This fluid may be obtained either by inserting an appropriate needle into the depths

of a crypt and sucking out the contents by means of an attached syringe or by puncturing the tonsil itself and then aspirating. Both these procedures require a little surface application of a solution of cocaine, "Percain" or suchlike local anæsthetic.

Sometimes incubation of the fluid obtained in this way from perfectly innocent looking tonsils, may yield pure cultures of organisms, such as the streptococcus, *Streptococcus hæmolyticus*, staphylococcus, pneumococcus *et cetera*, and may in consequence be the seat of a very definite and serious focal infection. This method of investigation may entail difficulties for the practitioner and may not in consequence be practicable. It is mentioned in passing.

Operative Treatment.

The surgical treatment of diseased tonsils only will be considered here, and since destruction of tissues by coagulation is a surgical process, treatment by diathermy will be included.

Guillotine Method of Partial Removal.

At one stage in the development of tonsil surgery it was thought sufficient simply to remove the protruding parts of the structure, and this was usually done by some form of guillotine. It was later found that this method was inadequate, because the deeper portions of the tonsils having been left (and as we have already seen that it is in these portions that infection is stored, as it were) the patient frequently was no better off than before operation. In some cases he was actually worse off, for the reason that the scarring following the operation and the subsequent contraction "bottled up" some of the crypts into close cavities, thus increasing the incidence of the focal infection factor.

Reversed Guillotine Method.

Later a method of removing what was (and still is by some) looked upon as the whole tonsil was devised and subsequently became almost universally used. It is known as the reversed guillotine method of tonsil enucleation or more popularly the "Sluder" method. It was actually devised and practised in Great Britain before Sluder described it, but, as in many other instances, it bears the name of a practitioner who later described it more persistently and in more detail perhaps than the British originator. The reversed guillotine method, as its name implies, is a method in which the guillotine is used in a reversed manner to the original. With the surgeon facing the patient, the instrument is held in the surgeon's right hand, when he attacks the right tonsil, and in his left hand when he deals with the left. The manœuvre consists of dislodging the tonsil from its bed into the ring of the guillotine by a circular movement of this part of the instrument so that the tonsil is dislocated in an outward, forward and upward direction, the tonsil, when so displaced by this manœuvre, being pushed through the ring by the forefinger (or by the thumb as some advocate) of the free hand. When the tonsil is thus dislocated and engaged, the blade of the guillotine is closed by the thumb of the hand holding the instrument. It will be readily acceded that this manipulation should be done with as little force as possible, for, as ever in surgery, we should aim at reducing trauma to a minimum. The ignoring of this most important principle has resulted at times in much damage to the fauces and muscles of the tonsil bed by bruising, which in turn has been followed by scar formation, a condition of "tight palate" resulting.

As a throat surgeon, the writer regrets to have to confess that this is a more frequent sequela of tonsillectomy by any method than is generally appreciated, but it is a more frequent happening after the rough use of the guillotine than after dissection. The more carefully and gently the procedure is performed, the less likely is this to occur. It will likewise be appreciated that the more easily the tonsil can be moved upon its bed, which means that the less the tonsil is tethered down to its bed by adhesions (the result of past inflammatory conditions), the more readily will it be dislocated into the ring of the guillotine and the more easily will the surgeon be able to avoid (by gentle adjustment of guillotine, ring and finger) removing parts of the pillars of the fauces and muscle of the tonsil bed. Theoretically the sharper the blade of the instrument, the better will the work be done, and, on the contrary, the more blunt the blade, the more crude the work and the more tearing is likely to occur. Practically there are objections to both a sharp and a blunt blade, and usually the surgeon prefers a blade of intermediate sharpness, and presses it well home. It is obvious from the above that the reverse guillotine removal of tonsils is more suitable for children than for adults, but the writer makes this provision that even in the case of children, if force is needed to dislocate the tonsil through the ring, the operation should be abandoned and the surgeon should resort to the method of dissection. It is preferable to come to a conclusion as to the method to be adopted at the time of examination, but a good plan is to make the inspection and manipulation of the tonsil with the end of a tongue depressor, in a manner as previously described, when the patient is under the anæsthetic and just prior to beginning the operation. As has been already pointed out, the term "tonsil" has been in the past applied to the large mass of adenoid tissue lying between the fauces. It was the custom to consider this mass as a separate body, but this has been shown not to be correct. This mass is only a part (the larger and most important part certainly) of a system of lymphoid tissue which lies to the side of the entrance to the pharynx and which is continued in one direction downwards on the lateral wall of the pharynx and in another forwards and inwards on to the base of the tongue. It is obvious that to remove these portions completely (which, by the way, is seldom necessary in children) would require more than one application of the guillotine and a good deal of force perhaps. To this latter procedure has been applied the term "expanded tonsillectomy."

Expanded Tonsillectomy.

Certain throat surgeons make use of blocks of wood or vulcanite moulded to the contour of the neck in the upper cervical region, and these are pressed inwards on the outside of the neck in order to make the parts more fixed and prominent so that the lower portions of tonsillar tissue may be engaged in the guillotine ring. If removal of these parts is necessary (and in adults it frequently is) the writer maintains that they should be removed by dissection. After the above explanation it can be understood why the statement has been made that tonsils are incompletely removed by the guillotine in the manner as generally practised. It is the reason, too, why recurrence of diseased tonsil tissue sometimes takes place, even to such a degree as to resemble an almost normal tonsil in size and position and to possessing a "capsule." Therefore, after removal of tonsils by the guillotine, the throat surgeon should look for and remove, if present, any enlarged pharyngeal or lingual prolongations. In the case of children, simply "plucking" off the obvious masses with a suitable forceps is usually sufficient. It will be seen, then, that, with certain reservations, the reversed guillotine method of tonsillectomy generally meets with the requirements in children and in those adults whose tonsils have not been tethered by adhesions to their muscle beds.

Tonsillectomy by Dissection.

For details of the many excellent methods of dissecting tonsils the reader is referred to the numerous text books on the subject. He is recommended to consider seriously the method as described by Waugh, of London, and one of its modifications, such as is described by Fowler in his excellent book, "Tonsil Surgery." He is enjoined likewise to adopt a simple method and to stick to it and make himself proficient in it. If he performs many of these operations upon adult patients, he is advised to consider seriously the adoption of local anæsthesia for such procedures, and he is reminded, if he does so, that preoperative preparation is of big importance in all operations under "local." The object of the surgeon, as elsewhere, is by his operative manipulations to do the least possible damage to the surrounding tissues. Further, if care be taken during the dissection to keep as near the tonsil as is possible and to tear the "capsule" away from the tonsil, the big bugbear of hæmorrhage will be considerably reduced, for it must be realized that hæmorrhage is most often due to faulty technique. The true "bleeder" is a rarity. The blame has often been referred to the patient when the fault has been with the surgeon. In an ideal result (and this is what we are continually aiming at) the whole tonsil bed is lined by fascia and no muscle fibres can be seen. According to the amount of adhesions in the "capsule" so the perfect result or otherwise will be obtained.

Universal adoption by throat surgeons of Fowler's slogan, "the tonsil, the whole tonsil, and nothing but the tonsil," would most certainly result in better work generally, which in turn would bring greater credit to the profession. For the above reasons the method of dissection appears to be the method of choice for the majority of adult tonsils and for that class of tonsil in children which has previously been referred to.

Tonsil Destruction by Diathermic Coagulation.

It is true that there is no method of treatment that is not best for some particular circumstance, and the destruction of tonsil tissue by diathermy is no exception. However, when one, after a big experience in throat surgery, has seriously considered the question, the circumstances in which the coagulation of tonsils by diathermy is found to be the best line of treatment, are reduced to very few. Here also our aim, as in other methods of tonsil removal, is to destroy "the tonsil, the whole tonsil, and nothing but the tonsil," and to do this by diathermy is a much more difficult matter than appears. It requires even greater skill and certainly more patience than is possessed by the average practitioner in the method. Dan McKenzie, who has done more to advance the method among English speaking surgeons than perhaps any other advocate, insists, in order to obtain consistently good results, upon a thorough knowledge of the anatomy of the tonsil, expertness on the part of the operator and a patience found in but few surgeons. It does not follow, therefore, because a practitioner possesses a diathermy apparatus, that he is competent to attack the tonsil. Moreover, as there are many practitioners who are now "diatherming" tonsils, we can expect to find in the future (and we are actually finding now) very many patients who have undergone this form of treatment and who still retain the greater part of their tonsils, and whose condition as a result of the superficial scarring has been rendered worse by the fact that crypts have been closed up and infective material has been "bottled up," with the result that the focal infection factor has been increased considerably. There are some practitioners who conscientiously believe that they have removed the tonsil, and have in consequence unwittingly misled their patients. This is serious enough, but what is more serious is that there are some practitioners who actually go so far as to guarantee to remove the tonsils totally and painlessly in four or five sittings. This sort of practice cannot be too forcibly condemned, for the statement is not true. The writer has had many such patients who have come to him to have their tonsils enucleated and who had been told by the diathermy "expert" that their tonsils had been destroyed. Most throat surgeons have had a similar experience, and this experience is becoming, I regret to say, more common day by day (Figures IX, X and XI). It is evident, therefore, that before undertaking this form of treatment the practitioner should learn not only how to work the apparatus expertly, but he should be thoroughly acquainted with the limits of the tonsil in order that he may be able to destroy "the tonsil, the whole tonsil, and nothing but the

tonsil." Dan McKenzie emphasizes this when he states:

> As in the ordinary operation, the lower "pole" of the tonsil near the tongue is apt to be overlooked. I have noticed that caseous *débris* formation goes on until the last remains have vanished.

He further states that the great drawback is its tediousness; it might have to be carried out every

FIGURE IX.

Tonsil viewed from the superficial or internal aspect which was dissected out after claimed total destruction by diathermy. Superficial scarring of tonsil is well seen, and many crypts are "bottled up." These on expression produced considerable *débris* and pus. The lower portion of the tonsil has been completely overlooked by the diathermy practitioner. A = pseudo lower "pole," B = lower lobe, D = pharyngeal branch.

week or fortnight for three, four or more months and that it required considerable expertness to perform it successfully.

FIGURE X.

Anterior view of another tonsil removed by dissection after claimed total destruction by diathermy. The superior pole is seen to be complete and does not appear to have been touched by the destructive process. From this aspect it can be understood how such a tonsil would appear to the untutored to be destroyed. This example emphasizes the need for defining the limits of the tonsil before and during treatment. A = pseudo lower "pole," b = lower lobe, D = the pharyngeal branch, C = capsule over upper "pole."

It therefore is evident that the person best suited to use the diathermy method of tonsil destruction is the throat surgeon, but be it carefully noted that he prefers the surgical removal of this structure in nearly all types of patients. The method is free from pain when only a small area is coagulated at a sitting. Should the coagulating process extend to the faucial pillars or the muscles of the tonsil bed (both of which are very difficult to avoid if one attempts to remove the tonsil thoroughly), pain, often severe, most assuredly will result. It is only when the procedure is undertaken by a practitioner thoroughly versed in the anatomy of the part and who possesses expert technical skill, that one expects the maximum tonsil destruction with the minimum extratonsillar damage and the minimum of pain and discomfort to the patient. It is a fact that the patients who, because of fear or dread of an operation, are the very ones who, although they might be thought to be the most suitable for undergoing this form of treatment, are really the least suitable for a tedious and at times a nerve-racking repetition of diathermy sittings. For such sittings are not free from anticipation and dread, as many of us, through our patients, have found out, and such proceedings may not be free from pain and discomfort, which

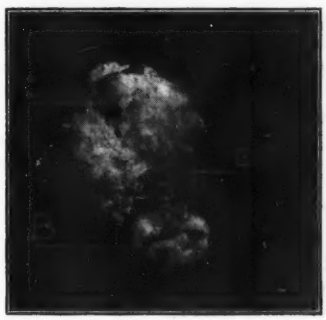

FIGURE XI.

External or deep view of tonsil removed by dissection after claimed total destruction by diathermy. B = lower lobe, C = capsule, E = equator.

may last for several days. Instances have been recorded in which mild has been converted into grave hyperthyreoidism following a few sittings of tonsillar diathermy. This sequela is not so likely to happen in the hands of the expert as in the hands of the occasional "dabbler" in the method. The writer was first introduced to surgical diathermy in the year 1912 and he has used it since then as a means of destruction of cancerous tissue when occasions warrant its use. His only reason for advising tonsil destruction by its aid in place of surgical enucleation is the "time" factor, but when this is added up, together with the discomfort of various sorts entailed by the many required sittings, it will be found to be longer and more upsetting to the patient perhaps than if he had undergone the operation of tonsil dissection; and most probably at the end the patient would in the former case still possess large tonsil remains. The writer advocates tonsillectomy under local anæsthesia, and when thus performed the operation should in his hands not last longer than fifteen to twenty minutes from the arrival to until the departure from the operating

room. The patient can with safety, except in very exceptional circumstances, leave hospital within three days, and if it is essential can attend to ordinary office work after this. Many a patient could "carry on" like the diathermy patient the day after the operation with no more discomfort in many instances. The writer, however, does not see the logic of such a practice.

For many years now throat surgeons and others have been earnestly endeavouring to convince the general medical public that the tonsil, when diseased, should be completely removed, until the repetition has almost become monotonous. Now that the time has arrived when this teaching has reached the stage of receiving almost universal recognition and its many benefits are being appreciated, we find that a group of practitioners is undermining the good effects of this teaching by loudly proclaiming that total removal of diseased tonsils is not necessary if the diathermic method of treatment be adopted, because by such a method what may be left of the tonsil is sterilized, they claim, during the process. Even admitting that after a course of such treatment the remaining portions of the tonsil tissue are sterilized, and this the writer admits happens in only a few instances, the sterilized state is only temporary. The writer feels that this argument of the practitioners in the method has influenced not a few to a wrong conception of the question and in consequence to a reversion to an inefficient line of treatment, that is, incomplete removal of diseased tonsillar tissue. He considers, therefore, that it is the duty of practising throat surgeons to refute the statements of claims made and to point out the true position, as has been attempted in this paper.

To sum up, one may say that diathermy, like all other methods of treating the diseased tonsil, has its sphere of usefulness, but that the sphere in this instance is a very limited one indeed.

Reports of Cases.

CARCINOMA OF CERVIX UTERI IN YOUTH AND EXTREME OLD AGE.

By ROLAND BEARD, M.C., M.B., B.S. (Adelaide), F.R.C.S. (Edinburgh), F.R.A.C.S.,
Gynæcologist, Adelaide Hospital; Assistant Obstetrician Queen's Maternity Home.

CARCINOMA of the cervix is so rare in the early twenties and in very old women that the interest in and statistical value of two such cases seem to warrant fairly complete publication. Furthermore, it is notable that the young woman was a *nullipara*, and the old one had cervical carcinoma in a completely prolapsed uterus.

The following are the reports of the two cases:

CASE I: Mrs. H., aged twenty-three years, was admitted to the Adelaide Hospital on June 7, 1929. She had been married two years. The duration of illness was four months. She complained of pain in the right lower part of the abdomen coming on three days before the period and lasting until the end of the period. She had had dyspareunia for two years after appendicectomy. Bleeding often occurred after coitus; she lost blood three times during the past month.

She had no children and had had no miscarriages. Menstruation was regular until this illness began. Now it was more frequent; it occurred every two to three weeks and lasted for four days. The loss was slight. She complained of an intermenstrual watery discharge, which was sometimes clear and sometimes orange coloured. Action of the bowels was regular; she was constipated at her periods. The patient had frequency of micturition, two or three times during the day and once or twice at night, with neither pain nor difficulty. No other symptoms were present.

The family history was good.

General examination revealed no abnormality. The external genitals were normal. The cervix pointed down the canal at the normal level, the os was dilated to the size of a two shilling piece. Several lobulated, softened bodies projected from the external os. The fornices were clear. The uterine body was situated slightly to the right. What appeared to be the fundus was palpable five centimetres (two inches) below the umbilicus. It was tender on bimanual palpation. The mass projecting to the right was shown later to be a large cyst. A provisional diagnosis was made of sarcoma or carcinoma of the cervix, and radical operation was decided upon.

Operation was performed under anæsthesia induced by ethyl chloride and ether given by the open method. The vagina was douched and painted with crystal violet and packed with gauze. A vertical subumbilical incision was made. A large cystic mass was seen at once with the right tube stretched over it, that is, a broad ligament cyst, the size of a large coconut. This extended above, behind and to the right of the uterus, burrowing under the caecum, and was adherent to the bowel and abdominal wall. With some difficulty it was enucleated and removed.

The operation then proceeded along the lines of Victor Bonney's Wertheim technique. In a late stage of the operation the rectum was found to be densely adherent to the posterior aspect of the cervix, and in spite of careful separation a breach of surface was left in the rectum, the size of a shilling. This was repaired by a double layer of catgut sutures.

The uterus, appendages *et cetera* were finally removed; the vaginal vault was closed, room being left for a gauze drain from the lower part of the pelvic cavity to issue through the vagina. The abdominal wound was closed as usual.

After the operation, owing to the complexity of the condition, post-operative shock had to be dealt with and, as Bonney advises, immediate intravenous injection of saline solution, 900 cubic centimetres (thirty ounces), was given, followed by saline solution given subcutaneously. "Hæmostatic serum" was given, as I was told after the operation that the patient was a bleeder. Stimulants, camphor in oil *et cetera*, were given by hypodermic injection. Forty-eight hours after the operation the gauze was removed from the vagina. Submammary injections of saline solution were continued during the first forty-eight hours.

The abdominal wound healed by first intention. Beyond an offensive vaginal discharge which lasted a fortnight without any fæcal matter, no complications disturbed the convalescence.

The pathologist, Dr. Bull, reported on the growth after removal as follows: "Sections show an epithelioma of the cervix. There is much inflammatory reaction and evidence of secondary infection."

Deep X ray therapy was then advised and was carried out by Dr. Stanley Verco.

Some thickening about the vaginal vault was apparent for a few months. This has now completely disappeared, and two years after operation the pelvic organs bimanually are soft, with no sign of any thickening or infiltration. The previous post-operative thickening must have been entirely inflammatory. The patient is quite well and does her own work.

My house surgeon, Dr. Reilly, gave valuable help in this case.

Case II: Mrs. M.M., aged eighty-six years, was ill for one week. She noticed a lump protruding from the vulva a few weeks before admission on June 1, 1931. She had been walking about and had had no pain. She had some urinary incontinence. The swelling was not bleeding on admission, but caused a slight purulent discharge.

On examination the lump was irreducible and appeared to be a proliferative type of cervical carcinoma in a senile uterus, completely prolapsed.

She had had two children and menstruation, according to her statement, continued until she was sixty years of age. There was no other noticeable abnormality in her history or on examination.

The pathologist, Dr. Bull, reports the section of growth as a squamous-celled carcinoma.

During the week after admission the patient exhibited mental disturbance of a senile type. The growth has increased in size, partly from congestion, and has now an extensive area of necrosis from friction, strangulation and degeneration.

The condition appeared unsuitable for radium treatment on account of the difficulties of nursing and incontinence *et cetera*. Deep X ray therapy was considered appropriate, and will be carried out if the condition of the patient permits of it.

Discussion.

On consulting the literature, there are reports of cases in young and old women. One may quote Fairbairn,[1] who states:

> The greatest liability to cervical cancer occurs towards the end of a woman's reproductive life. It is very rare before 25, rare before 35, the vast majority arise between 35 and 65 . . . It is unusual to see cases above the age of 75. Virgins are very rarely and *nulliparæ* rarely affected. The great majority occur in parous women.

Wilson[2] (Birmingham) supports these opinions and remarks that:

> Cancer of the cervix is very rare in extreme old age. However, cancer of the cervix occasionally is seen at extremes of age. Joseph Adams relates a case in a child of 2½ years; de Rouville a case in a girl of 18; Findlay records a case in a woman of 93 who had borne eight children, one of whom died at the age of 48 of uterine cancer.

Nevertheless, these are extreme rarities. It will be noticed that the senile patient had had two children. On the other hand, the youthful patient had had no children nor any miscarriages. The youthful patient had had a radical Wertheim hysterectomy followed by deep X ray therapy and two years later appears quite free from local recurrence or distant metastases. Her general health, she recently remarked at a post-graduate clinic, was better than for four years. In this case it seems an interesting possibility, that the inflammatory condition accompanying the cervical carcinoma might have had a protective influence against malignant spread.

The case also illustrates, as Dr. Ralph Worrall has suggested, that the most unpromising case sometimes may yield a great victory to the surgeon who does his best.

References.

(1) Fairbairn: "Gynæcology and Obstetrics," 1928, page 667.
(2) Wilson: Eden and Lockyer's "Gynæcology," Volume II, 1917, page 449.

PRIMARY KIDNEY INJURY, APPARENTLY DUE TO LEAD.

By S. F. McDonald, M.D. (Melbourne), M.R.C.P. (London),
Honorary Physician, Hospital for Sick Children, Brisbane.

In those instances of chronic nephritis in young people in which lead is held to have been the cause, it is commonly supposed that the action of the lead was rather primarily on the vascular system and only secondarily on the essential kidney tissue. Thus patients are seen in whom the blood pressure is rising steadily, although urea concentration and blood urea are almost within normal limits.

The following case report, however, is an instance of tubular injury, with renal failure such as Fishberg states is produced in laboratory animals by prolonged feeding with white lead.

M.B., aged three years and eleven months, a female, was first seen by me on March 5, 1930. I later learned that she had been attending the out-patient department at the Hospital for Sick Children with great irregularity. There was one younger healthy child in the family.

For eighteen months the patient had suffered from abdominal pain, weakness in the knees, clumsiness of the feet, weakness of the hands and increasing pallor. For the past three days she had had a slight cough and was feverish at night. The parents stated that she neither bit her nails nor sucked her fingers (these statements were disproved by the most cursory examination of the child), but that there was ample powdered lead on the veranda.

Examination revealed a thin, limp and anæmic child, a mouth breather with slightly enlarged cervical glands. The teeth were good; there was no blue line. The tonsils were enlarged and adenoids appeared to be present. Heart and lungs were normal. The systolic blood pressure was 90 and the diastolic pressure 60 millimetres of mercury. These figures were approximate only, owing to the size of the cuff. This figure is normal according to Fishberg.

In the abdomen nothing was palpable; the child offered no objection to deep pressure. The parents stated that during attacks of pain she preferred deep pressure to any other form of relief.

The urine had a specific gravity of 1·015; it contained a definite cloud of albumin and many granular casts. The blood gave no reaction to the Wassermann test.

Slight double wrist drop, very marked double foot drop and weakness in extensors of knees were present, so that the child was unable to stand. The deep reflexes were absent. The plantar reflexes were sluggish and flexor in type.

Blood examination revealed a secondary anæmia and the film showed gross basophilic stippling and polychromasia. The red cells numbered 4,000,000, and the leucocytes 12,800 per cubic millimetre; the hæmoglobin value was 70%.

The parents were instructed to bring the child in two days for splinting and treatment by intravenous injection of sodium thiosulphate. They were also instructed to bring up a litre of urine. They returned a week later with the child gravely ill, after being apparently much better for five days. (Hence their non-return.)

She now had "pains all over" and general loss of power. The temperature was 37·8° C. (100° F.) and the pulse rate 140 (the child was much distressed by examination). Slight basal bronchitis was present. The abdomen was clear. All limbs were completely paralysed. No strabismus, no headache and no papilledema was present. The patient could not be cared for at home, so she was sent to the Hospital for Sick Children.

There she became rapidly worse and the paralysis became general; the abdomen was affected, so that her breathing was greatly distressed. Blood urea was found to be 125 milligrammes per 100 cubic centimetres. The temperature rose to 39·4° C. (103° F.). There was almost complete suppression of urine, but no cause for the condition could be determined, though a deeply placed pneumonia was thought the most likely cause. Delirium supervened and she grew rapidly worse.

The child died almost immediately after blood transfusion on April 16, 1930, from 270 to 300 cubic centimetres of citrated blood being introduced.

Examination of the kidneys only was permitted. Dr. J. V. Duhig, Pathologist to the Brisbane and South Coast Hospitals Board, kindly made the following report:

> The striking feature of the section is the severe damage done to the tubules, while the glomeruli remain to a great extent unaffected. This is well shown in the photomicrograph (see figure in supplement). It

will be seen that the convoluted tubules show distinct change, the epithelium having undergone the whole range of change from cloudy swelling, granularity of the cytoplasm without much nuclear change to complete necrosis with pyknosis and karyorrhexis of the nuclei. The tubules are filled with granular casts in which can be detected nuclear *débris*. The picture is fairly representative of the section in general, which also shows in parts: (i) A secondary glomerular change, in areas where the tubular lesion is most advanced, consisting of epithelial proliferation of tuft and capsule, fusion and occasionally crescentic hyalinization. (ii) Such interstitial change as has occurred is scanty and confined to the areas about the interlobular arteries. The vessels themselves have escaped gross damage. Note the healthy state of the afferent vessel of the glomerulus in the picture.

This appears to me a case of acute tubular (catarrhal) nephritis.

The foregoing illustrates two points:

1. The rapid increase of paralysis in cases of plumbism on the advent of an acute febrile illness. In some cases when a paralysis has appeared *de novo* this has led to a diagnosis of acute anterior poliomyelitis.

2. The evidence of early tubular damage, shown clinically by the albuminuria and casts, without evidence of vascular damage.

3. It is probable that the grave condition here described is an advanced form of the kidney damage which produces the albuminuria so commonly seen in juvenile plumbism. Thus of twenty-two patients with plumbism shown at a clinical meeting at the Hospital for Sick Children in February, 1922, no less than seven showed albuminuria, sometimes with granular casts.

Bibliography.

M. A. Fishberg: "Hypertension and Nephritis," 1931.

FIBRO-SARCOMA OF THE NECK.

By R. M. GLYNN, M.B., B.S. (Adelaide), F.R.C.S. (Edinburgh),

Honorary Assistant Surgeon, Ear, Nose and Throat Department, Adelaide Hospital.

F.K., AGED fifty-eight years, was first attended by Dr. Rice in an attack of dyspnœa on April 12. The attack lasted half an hour. He had another attack next day, lasting about three-quarters of an hour, after which I saw him.

Three weeks previously he had a little shortness of breath when he first started to play tennis. This had gradually worn off after playing for a short while. His voice has been getting a little husky for the last twelve months and the family had complained that he made a slight noise on swallowing. He thinks he has lost weight. He says he has always been liable to colds in his throat and similar complaints.

On examination I found a smooth and firm looking mass filling up the whole of the right side of the pharynx and larynx as far as but not overlapping the left aryepiglottic fold. Apparently it was not attached to the pharyngeal wall laterally or posteriorly; it was œdematous. On hooking the mass aside after swabbing with cocaine, the glottis could be seen pushed over to the left, but apparently normal. I could not determine if the mass originated in the pyriform fossa or from the right aryepiglottic fold, nor whether the latter was involved or merely overlapped.

Externally the thyreoid cartilage was rotated to the left and forwards. No glands were palpated. It was decided to do Trotter's transthyreoid pharyngotomy.

"Avertin" was given half an hour before by Dr. Gilbert Brown. Tracheotomy was performed and a skin incision for glands was made before ether was necessary; ether was then given through a tracheotomy tube. The deep cervical glands were enlarged, but subsequent inspection showed them to be normal. The sternomastoid muscle was sutured to the prevertebral muscles, the ala of the thyreoid and the great cornu of the hyoid were removed, and the pharynx was opened. A mass the size of a hen's egg was found in the pyriform fossa overlapping the aryepiglottic fold and pushing the larynx over to the left. It was covered with pharyngeal mucosa, except at its attachment below. It apparently originated from the cricoid cartilage internal to the cricothyreoid joint, being extrapharyngeal in origin. It had then invaginated the pharyngeal mucosa and filled up the pyriform fossa. Some of the fibres of the *crico-arytenoideus lateralis* and the oblique fibres of the *crico-thyroideus* were damaged in removing it.

Sections show a fibro-sarcoma. The tumour possesses a capsule in some parts, but there does not appear to be any definite invasion of normal tissues, however, the tumour pushing them aside rather than invading them. There are areas of degeneration and sclerosis, and in the cellular areas mitotic figures are rarely to be seen.

The feeding tube was removed on the twelfth day and the tracheotomy tube on the thirteenth day. Convalescence was uneventful, except for some coughing with his earlier feeds after removal of the tube.

REMOVAL OF CLINICAL THERMOMETER (HALF MINUTE) FROM THE BLADDER BY MANUAL MANIPULATION.

By ARCHIE ASPINALL, M.B., Ch.M. (Sydney), F.R.A.C.S.,

Honorary Surgeon, Sydney Hospital; Honorary Consulting Surgeon, Royal South Sydney Hospital.

WHILST looking through some papers I came across the notes of this case and thought it might be of interest.

In 1924 a married woman, aged thirty-five years, was admitted under my care at Sydney Hospital with the history of having attempted to take her temperature in the vulva and having lost the theremometer. She was examined by her family doctor and an unsuccessful attempt was made to recover the thermometer. On admission the patient had no pain, but could not micturate properly, only a few drops of urine being passed at a time. X ray examination revealed the thermometer lying transversely in the bladder.

As the patient was thin, it was quite easy under general anæsthesia to palpate the thermometer with one hand on the abdomen and a finger in the vagina. The bladder contained several ounces of urine. With patience it was found possible to work the rounded upper end of the thermometer towards the urethra and to get the thermometer in the long axis of the pelvis. As it could not be made to enter the urethra, I placed the tip of my little finger in the urethra and gently dilated it, and with my assistant's finger in the rectum I was able to press the thermometer by the hand on the abdomen against the tip of the finger in the urethra and, maintaining the pressure, I gently withdrew my finger from the urethra with the thermometer still pressed against it.

It was a tedious manœuvre, and the successful termination was enhanced by the quiet remark of the theatre sister as she looked at the thermometer, to the effect that "the temperature was normal."

The patient made an uninterrupted recovery.

Reviews.

PROGRESS IN OBSTETRICS AND GYNÆCOLOGY.

"OBSTETRICS AND GYNÆCOLOGY" (Practical Medicine Series, 1930) is one of a series of eight year books issued at various intervals during each year by "The Year Book Publishers" of Chicago. They cover the entire field of recent medicine and surgery and each volume is complete on the subject of which it treats for the year prior to the time of its

publication. The obstetric portion is edited by Joseph B. De Lee and J. P. Greenhill, and the gynæcological part by John Osborn Polak.[1]

The obstetric portion deals with abstracts of the more important papers from all parts of the world, with comments thereon in many instances by the editors. The contents include papers dealing with the various aspects of pregnancy, labour, the puerperium and the new born.

The gynæcological part deals with general principles, anatomy and physiology, diagnosis, operative technique, menstruation and its disorders, the hormones, the ovary, displacements and injuries, infections and allied disorders, tumours and sterility, and comments, favourable and otherwise, are added when thought advisable.

The chief value of a book of this kind is as a reference *résumé* of the work which has been done during the year and the lines along which obstetric and gynæcological thought has been directed. Many papers which in the ordinary course of events would pass unnoticed, being in foreign journals and unavailable for ready reference for many practitioners, are here abstracted, and it is of interest to compare the different methods adopted in other lands in attacking common problems, and to note the varied opinions expressed. The real value of various methods of treatment can possibly be better assessed when viewed from the many angles which such a collection presents.

It is manifestly impossible out of such a vast quantity of material to select any for particular mention. Many of the papers are particularly helpful and instructive. Altogether it is a very useful book of its kind and can be recommended to all who are interested in these subjects.

THE MANIKIN IN OBSTETRICS.

"Operative Obstetrics on the Manikin," by Charles B. Reed, is intended as a guide for the undergraduate who aims to do general work or to specialize in obstetrics, for the practitioner who wishes to improve his technique, and for the teacher who exemplifies his operations on the manikin.[2]

As the title suggests, the various operative procedures which can be practised on the manikin are fully described, but the author has, in addition, included various operations such as Cæsarean section, pubiotomy *et cetera*, which require other material for their demonstration. However, the value of the book probably is enhanced by their inclusion, as thereby a fairly complete list of all obstetric operations is contained in the reasonable compass of three hundred pages.

The book is an easy one to read, the various steps are clearly indicated and described, the complications which may arise are duly stressed, the dangers to be avoided are emphasized and numerous illustrations help the mental digestion of the suggestions offered.

American methods, in some particulars, are naturally different from our own and those of the British school. For instance, in America apparently the forceps favoured by most obstetricians is the Simpson forceps, whereas in this country probably the majority favour a variety of the axis traction type. Also the dorsal position for delivery is universally shown and the left lateral quite omitted. Minor differences in the treatment of occipito-posterior positions and face presentations were also noted.

It was pleasing to note the great stress laid on what are termed "The Fundamentals" at the beginning of the book. The importance of a thorough study of the bony pelvis and the *fœtus in utero* is stressed, and the various methods for determining the size and the type of the pelvis, the size of the infant and the various methods of estimating any disproportion between the two are fully described.

The chapter on the forceps is a very good one. The various types of forceps commonly used—Simpson's, Tarnier's axis traction, Kielland's—are described and their advantages compared. The method of application of each type, the indications for their use, the most suitable time for application, the dangers and complications to both mother and infant from their misuse are all dealt with in detail.

Occipito-posterior positions, face, breech and transverse presentations, the reposition of extremities and cord, and the various destructive operations are all discussed. Dilating operations and the various indications for induction of labour, together with the methods of so doing, are discussed, as well as *ante partum* hæmorrhage, *post partum* hæmorrhage and the complications of the third stage and manual removal of the placenta. The book can be recommended to all those who wish for a sound and complete description of operative methods as practised in America.

LECTURES ON SOCIAL LIFE.

The Halley Stewart Trust, founded in 1924 for "research towards the Christian ideal in all social life," has among its objects to provide for a lecture or lectures annually and to pay for their publication and distribution. "Health and Social Evolution" is the title of the lectures delivered by Sir George Newman in 1930.[1]

Beginning with a short description of the social life and standard of health in England during the middle ages, he traces the gradual improvements that evolved with increasing knowledge. He gives an account of the dreadful conditions existing in Britain during the eighteenth and first part of the nineteenth centuries, and with a wealth of words and a fund of figures sets out the reforms attributed to preachers and philanthropists, parliaments and public bodies. Finally he sums up "Gains and Losses in National Health," and it is with a certain sense of relief that we read that "it is not the State that can or should give us all good things."

The author has had long experience in the health service of Great Britain as a permanent official and has an intimate knowledge of the public health acts under the local government boards. He is an enthusiast and an idealist, and his audience on the occasion of these lectures was similarly inspired. It was accordingly an opportunity for oratory. Cold-blooded folk who like their facts off the ice, may find themselves nodding and tempted to put this book aside till after tea. It contains, however, a great deal of valuable information and those who are of the proper temperament will read it with enthusiasm and appreciation.

AN INTRODUCTION TO PSYCHOLOGY.

It is no exaggeration to state that one of the best introductory books to the study of psychology that we have seen is "Psychology in General Nursing," by Dr. Isabel Wilson, formerly physician to the Tavistock Square Clinic for Functional Nervous Diseases.[2]

It is unnecessary at this period of time to make the statement that a knowledge of psychology is as necessary to the modern medical practitioner as is a grounding in physiology. Though Dr. Wilson has writtten for nurses, it will give the reader insight into the application of psychology, not only to nursing, but to general medical practice.

The author describes the psychology of the sufferer from organic disease, a subject which has hitherto received scant attention because it does not come within the province of the practising psychologist. Not only is this

[1] "Practical Medicine Series: Obstetrics and Gynæcology"; Series 1930. Chicago: The Year Book Publishers. Crown 8vo., pp. 640. Price: $2.50 net.

[2] "Operative Obstetrics on the Manikin for Students and Practitioners," by C. B. Reed, M.D., F.A.C.S.; Philadelphia: P. Blakiston's Son and Company. Royal 8vo., pp. 330, with 254 illustrations. Price: $4.00 net.

[1] "Health and Social Evolution," by Sir George Newman, K.C.B., M.D., LL.D. (Halley Stewart Lecture, 1930); 1931. London: George Allen and Unwin. Crown 8vo., pp. 200. Price: 4s. 6d. net.

[2] "Psychology in General Nursing," by I. G. H. Wilson, M.D., D.P.M.; 1931. London: Edward Arnold and Company. Crown 8vo., pp. 224. Price: 5s. net.

subject handled in an adequate and practical manner, but the whole book is practical in tone. It is, however, a practice based on knowledge and tempered by well balanced judgement. The writer rightly states: "Understanding does not follow the giving of masses of information only, but of information which is sensible, practical and essentially concerned with the living human patient."

Her candour should be commended in making another statement: "If we know that it (psychology) is limited after all, like medicine and surgery, we shall get the best help from it." This sentence is quoted because the worst detractors of psychology are fanatical enthusiasts, whether they be professional or amateur.

LABORATORY PROCEDURE IN DIAGNOSIS.

A FLOOD of books like "A Textbook of Laboratory Diagnosis," by Osgood and Haskins,[1] was, of course, inevitable, and some of the value of such works must depend on the card index system on which the book is to be built up. The work under review is a veritable encyclopædia, though whether the authors have made the best use of their material is still a little doubtful. It probably challenges comparison as to plan with a recently produced Australian work of a similar though more modest kind. Osgood and Haskins present their work in two sections, the theoretical and clinical physiology of the various bodily systems, followed by the laboratory and practical applications of this. Such a system naturally involves much backward and forward reference. Again, after a long study of recent books of this type we confess to having been converted to the system of chapter-end references instead of the old small type footnotes. Taking the book as it stands, Chapter I of Part I, an ethical homily, reflects its middle-Western American origin and seems superfluous. All the rest of Part I condenses sound theory and the speculations of the best workers, though it must be pointed out that these must have lacunæ and cannot replace study of standard text books and reputable papers as sources of detailed knowledge. The chapter on hæmatology, however, deserves the highest praise, forming in itself quite an excellent monograph on the subject, due no doubt to the stimulus of Maximow, to whom indeed the authors acknowledge their debt. If the book only stimulates consultation of Maximow's masterly summaries of knowledge on, say, lymphocytes and histiocytes, it would not be in vain. The chapter also is as beautifully illustrated as any that we have seen.

Part II disarms criticism, since it is an encyclopædia based on a truly formidable index system, the only omissions to be found being mention of Giemsa's and the Romanowsky methods of blood staining, and apparently the authors prefer the McKesson and Sanborn graphic method of metabolism estimations to the portable Benedict apparatus as a routine, while the Douglas-Haldane method, by which overbreathing can infallibly be spotted, is not even mentioned.

The authors are apologetic about the inclusion of bacteriologic (*sic*) and serologic (*sic*) technic (*sic*), and this section could well have been omitted.

The phrasing is often strange to an English ear and is sometimes loose. For instance: "Price-Jones and others measure the diameters of a large number (1,000) of red cells with the eyepiece micrometer in anæmia cases [horrible phrase—Editor] and make a diagnosis of pernicious anæmia when many large cells are found" (page 189). Price-Jones does nothing of the sort. In paper after paper he has shown that it is the standard deviation and coefficient of variation which matter.

There are two indices, one to diseases, an admirable innovation, and a subject index. We note that Werlhof's disease is indexed rather pedantically as "*Morbus maculosus Werlhofi*."

[1] "A Textbook of Laboratory Diagnosis, with Clinical Applications for Practitioners and Students," by E. E. Osgood, M.A., M.D., and H. D. Haskins, M.D.; 1931. Philadelphia: P. Blakiston's Son and Company. Royal 8vo., pp. 495, with 21 figures in the text and six coloured plates. Price: $5.00 net.

The paper is sumptuous and the printing and binding all that one could expect from the house of Blakiston. The book would form a most respectable addition, for its encyclopædic character alone, to the library of biochemical and hæmatological workers.

Notes on Books, Current Journals and New Appliances.

THE MAYO CLINIC.

MEDICAL literature grows apace. Workers at the Mayo Clinic contribute largely to its volume. During 1930 the papers written by workers in the Mayo Clinic and the Mayo Foundation numbered 482. Volume XXII of the "Collected Papers" from these two bodies has been published; it bears the date May, 1931.[1]

This book is well known to the medical profession. In this volume eighty-five of the papers are reproduced in full, thirty are abridged and of 312 only the titles are given. Many of the articles appearing in medical journals must be described as "pot-boilers." It is useful, therefore, to have in one volume the record of work done at the Mayo Clinic which is considered to be worth while. Eustermann's observations on ninety-three cases of gastric syphilis have already been noted in this journal. Donald C. Balfour discusses the results of gastro-enterostomy for ulcer of the stomach and duodenum. He also discusses the causes of unsatisfactory results in the treatment of peptic ulcer by surgical operation. E. Starr Judd and J. M. Marshall discuss gall stones in the common bile duct. They report that among 1,608 patients there was a mortality rate of 6·7%. Of those who survived 75 or 4% came back to the clinic on account of recurring trouble; from 55 of these gall stones were again removed from the common duct. F. W. Rankin and J. R. Learmonth contribute a paper on section of the sympathetic nerves of the distal part of the colon and rectum in the treatment of Hirschsprung's disease and certain types of constipation. There is also a paper by P. S. Hench, M. S. Henderson, L. G. Rowntree and A. W. Adson on the treatment of chronic "infectious" arthritis by sympathetic ganglionectomy and trunk section. There are several other articles on the sympathetic nervous system. Several important papers on neurological problems are included.

It is not possible in the available space to do more than draw attention to some of the matters discussed in this volume. Those who place this publication on their shelves every year will find this volume well up to the standard of its predecessors. Those who have not yet discovered the book will be well advised to seek it.

A STUDY OF HAIR.

DR. JOHN GLAISTER, Junior, Professor of Forensic Medicine, University of Cairo, has made a most important study of hair and wool.[2] His study includes the mammalian group of animals and special consideration has been given to human hair. This book is of considerable importance to medico-legal experts, and will probably be used widely as a book of reference. It is of little interest to the general practitioner. The author illustrates his work extensively by plates showing the microscopical appearances of hairs in their longitudinal and transverse planes. A description of each plate is included. There is an interesting section on the recognition of human hair. The bibliography is extensive and should be useful.

[1] "Collected Papers of the Mayo Clinic and the Mayo Foundation," edited by M. H. Mellish-Wilson, R. M. Hewitt, B.A., M.A., M.D., and M. A. Felker, B.S.; Volume XXII; 1930. Published 1931. Philadelphia: W. B. Saunders; Melbourne and Christchurch: James Little. Royal 8vo., pp. 1125, with illustrations. Price: 63s. net.

[2] "A Study of Hairs and Wools Belonging to the Mammalian Group of Animals, Including a Special Study of Human Hair Considered from the Medico-Legal Aspect," by John Glaister, Junior, D.Sc., M.D., J.P.; 1931. Cairo: Misr Press. Demy 4to., pp. 187, with 110 plates.

The Medical Journal of Australia

SATURDAY, OCTOBER 10, 1931.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE AUSTRALASIAN MEDICAL PUBLISHING COMPANY, LIMITED.

When the Australasian Medical Publishing Company, Limited, was founded, those who drafted the Memorandum of Association were men of vision. They included in the objects of the Company all the possible activities of a printing and publishing company devoted to the interests of a learned profession. Three of the objects are as follows:

To conduct establish print publish and circulate or otherwise deal with any newspaper or newspapers journal or journals magazine or magazines and other publications literary works and undertakings and in particular a journal to be the official journal or organ of the respective Branches of the British Medical Association in Australasia and New Zealand represented in the Company.

To carry on business as the proprietors and publishers of newspapers journals magazines books and other publications literary works and undertakings.

To carry on all or any of the businesses of printers stationers lithographers type-founders stereotypers photographic printers photo.-lithographers chromolithographers engravers die-sinkers bookbinders designers draughtsmen paper and ink manufacturers booksellers publishers advertising agents engineers and dealers in or manufacturers of any other articles or things of a character similar or analogous to the foregoing or any of them or connected therewith.

The history of The Medical Journal of Australia is well known to members of the medical profession in the Commonwealth. The members of the Australasian Medical Publishing Company, Limited, are elected by the several Branches of the British Medical Association in Australia. The Medical Journal of Australia is the organ by which the Branches record their activities, and it is the medium through which members of the Branches express their views on matters scientific and medico-political. Every member of the British Medical Association in Australia has therefore, or should have, an interest in its welfare and progress. The journal is not the only property of the Australasian Medical Publishing Company, Limited. The Company has made and is making steady progress towards its objectives. The setting up of The Printing House was due to the dogged determination of the late Henry William Armit. There were some who thought the project unwise and some who held that the venture was premature. But the confidence of the Directors in the scheme and in its originator has been justified and the building up of a scientific press for Australia is becoming, nay, has become, an established fact. As time passes scientific workers will appreciate in increasing measure the facilities offered to them.

The annual meeting of the Australasian Medical Publishing Company, Limited, was held on September 23, 1931. An account of the meeting, together with the Directors' report, is published in this issue. The result of the year's work must be regarded as a matter for congratulation if the present financial stringency is taken into consideration. The most satisfactory point, however, is not that the Company has been able to pay its way during hard times, but that the goodwill of the Company has become established. This is evident from the way in which the services of the printing department are being sought by scientific workers in universities, medical societies and kindred organizations, and by business firms.

Thus another milestone on the road of progress has been passed. The readers of this journal should note the passing and help in the advance towards the next milestone. The success of the Company spells the success of The Medical Journal of

Australia. Members who may feel no personal concern in the Company and its printing activities will possibly appreciate the advantages of a journal freed from financial embarrassment. The Manager of the Company enjoys the loyal and whole-hearted cooperation of every member of his staff; without this he could not have achieved his success. He looks for the sympathetic support of medical practitioners; with this the success of the Company will be greater. Medical practitioners may help by talking about the work of the Company among their friends, particularly among those of allied professions, by practical support on the printing side when possible, by criticism if they think it necessary, and by a personal interest. Personal interest will be stimulated if visitors to Sydney from the country or from the other States will visit The Printing House and try to understand its aims and objects.

Current Comment.

FUNCTIONAL DISORDERS OF THE COLON.

The colon is a much abused viscus. On the one hand are those people who hold it responsible for all man's ills, and who perhaps scourge it with frequent purgation; on the other are those who insult it by keeping it overloaded with scybalous contents. Disturbances to its function are the commonest of all disorders, as the numerous advertisements for laxatives and purgatives testify. Unfortunately, some medical practitioners are apt to regard the colon merely as a bowel that requires "opening" at more or less frequent intervals; to obtain this desirable effect they administer an occasional dose of some aperient drug without thought of any possible result beyond the immediate one of defæcation. No doubt the medical practitioner often feels he has little time for attention to the neurotic person who is habitually steeped in colonic meditation; but this person requires attention, for his physical, as well as his mental, condition. Functional disorders of the colon require a great deal more study than they have hitherto received. A recent paper by Edmund I. Spriggs is timely and should be of interest.[1]

Spriggs's conclusions are based on the results of the investigation of many thousands of cases. The functional disorders considered by him are: colonic delay or constipation, irritable colon, spastic colon and colospasm, mucous colitis (catarrh of the colon) and muco-membranous colitis; he remarks that coloptosis may coexist with any of these disorders.

[1] *The Quarterly Journal of Medicine*, July, 1931.

Digestion is carried on in the caecum and ascending colon, where bacteria produce ferments that break up cellulose. The process is aided by the slower passage of food through the large bowel. Fluid is absorbed from the chyme in the colon; if this is prevented, wasting occurs. Spriggs mentions a case published by Monier-Williams, in which the patient, who had a colostomy opening, became more and more emaciated, until the measure was adopted of plugging the colostomy opening for twelve hours each day, to allow the natural chyme to pass through. A female patient, on whom the operation of ileo-sigmoidostomy had been performed, continued to lose weight until she was reoperated upon and the ileum was transplanted into the caecum. The third function of the colon is the secretion of mucus, which mixes with the fæces and acts as a lubricant. The fourth function is the "passage of waste matter along the bowel and its extrusion at intervals." In health, most of the colon is full. The movements of the colon are: pendulum or mixing movements (mainly in the caecum, ascending colon and transverse colon); transporting movements involving short sections of the gut; and mass forward movements in which nearly the whole of the large bowel may be involved. Of the many causes of functional disorders of the colon the two generally held to be first in importance are neurosis and constipation. Spriggs regards instability of the nervous system as a predisposing condition. He agrees that constipation is an important cause, but he argues that the treatment of real or imaginary constipation by the administration of irritating drugs is just as important.

Spriggs studied especially 242 patients who complained particularly of symptoms referable to the colon, and whose colonic condition was found to be the most important feature of their illness. Of these 157 suffered from mucous colitis and 85 from a condition of irritable and spastic colon. Constipation is almost always a feature of these disorders. Sometimes patients complain of diarrhœa; but it is often found that this is a result of irritation and infection secondary to constipation, and is intermittent. Nervous diarrhœa is rare; loss of appetite is a prominent symptom, and nausea is common. Headache, backache, weariness and depression are the chief nervous symptoms. Spriggs points out that paroxysms of colospasm may be accompanied by alarming symptoms—rapid pulse, oppression, shivering, vertigo and numbness. He stresses the necessity for recognizing the existence of organic abdominal disease, with which functional disorders of the colon are often associated. He utters a warning, however, against the too hasty removal of the appendix, which, after all, may only be affected in common with the rest of the bowel.

Nearly all patients suffering from functional disorders of the colon recover if the constipation can be cured without the employment of chemical irritants. These disorders usually result from the bad habits of a nervously predisposed person; thus

they can often be prevented by the institution of ordinary hygienic measures, such as regular meals, exercise and sleep. A plain mixed diet and plenty of water should be taken. Liquid paraffin may be required; but no other aperient should be used. In therapeusis the same measures are employed. Here the most important rule is to allay the patient's anxieties, and to teach him that there is no great harm in constipation of a couple of days' duration; that the passage of a large semi-fluid motion, as the result of his taking an aperient, is not always beneficial; and that the constant use of aperients does not tend to relieve weakness and abdominal discomfort. An additional desideratum in treatment is the provision of a suitable occupation for the patient. If X ray examination reveals that the delay to the passage of the bowel contents is in the caecum, some aperient, such as senna, may be necessary in addition to liquid paraffin at first. Removal of septic foci and attention to the general health are measures that naturally suggest themselves. In rare instances operation is necessary; but it should never be undertaken until suitable and persistent medical treatment has failed, and there are sound scientific reasons for believing the operation will benefit the patient. Spriggs draws a simile between the untrained bowel and the athletically untrained man. Operation is no more likely to make the latter fit to run a race than the former to perform its normal functions. Concerning colopexy he remarks that eighteen patients under his care had been subjected to this operation, which is designed to immobilize an organ that was meant to be mobile; but the operation had been ineffective; "and ineffective operations make such people worse."

Spriggs's valuable paper is a sound, unbiased contribution to the study of functional disorders of the colon; it is all the more worthy of consideration in that it is singularly free of faddism. Only a few of its features have been touched on in this brief comment; the original should be read by all who can obtain it. It has been remarked by more than one authority that, in the prevention of constipation of children, a little wholesome neglect is of greater value than medicine and solicitous instruction, both of which may assist the development of an unhealthy mental attitude. The same may be said of the grown man and woman. The person whose bodily functions are normal has no anxiety concerning them.

PITUITARY DYSFUNCTION.

Dysfunctions of the various endocrine glands present many puzzling and apparently anomalous features. One cause of confusion is that in some instances the dysfunction is due to no discoverable lesion, while in others a tumour or other pathological condition is present. There is often no means of ascertaining clinically whether the gland is affected by new growth, inflammation or what not; and, to make confusion worse confounded, tumours sometimes result in hyperactivity, sometimes in hypoactivity, and sometimes they have no obvious effect. Within recent years endocrinology has received a great deal of attention; and sufficient new information has been gained to justify the hope that some order will shortly emerge from the present chaotic state of knowledge. Perhaps more perplexing problems have been set by the pituitary than most of the other endocrine glands; and not the least of these problems is that presented by the occurrence of hypogonadism in association with both underaction and overaction of the pituitary or maybe its anterior lobe. William R. Henderson offers a reasonable explanation of the relationship between pituitary disorders and hypogonadism.[1] He points out that two hormones are believed to be evolved by the pituitary—one concerned with growth, the other with the reproductive functions. The cells of the anterior lobe of the pituitary are of three main types, acidophile, basophile, and neutrophile. Adenomata may be formed from any of these types of cells. Acidophilic adenomata cause acromegaly; neutrophilic adenomata cause hypopituitarism. Basophilic adenomata are minute growths and are not so likely to cause symptoms; though the basophile cells apparently secrete the hormone that stimulates the development of the sexual function. The neutrophilic growths are the commonest.

As a result of the investigation of 367 cases of pituitary adenomata in women, Henderson reached the conclusion that sexual dysfunction, as evidenced by amenorrhœa, resulted from pressure on the basophile cells of the anterior lobe. A tumour of either type—acidophile or neutrophile—produced the symptom when there had been sufficient growth to cause considerable expansion of the *sella turcica*. It is pointed out that in favourable cases the surgical removal of the adenoma and the consequent relief of the pressure are followed by a resumption of normal menstruation. Henderson makes due acknowledgement to Cushing, who first suggested the possibility of this mechanical cause for the depression in the basophile cells' activity.

The correlation of pituitary disorders with the male's gradual loss of sexual activity presents greater difficulties; for a man is affected by no such well-defined abnormality as amenorrhœa, which is often the first symptom complained of by a woman. It was noted, however, that no man whose *sella turcica* was about normal in size, had lost all *libido*. Testicular atrophy and impotence develop later in the disease, when the tumour has reached a large size. Henderson's views are of very great interest. It is mainly for the surgeon and the radiologist to prove whether or not they are correct in most particulars. Of ocurse, it cannot be allowed that all combined pituitary and gonadal disorders are due to pituitary tumours. There is no reason to believe that simple pituitary underaction does not occur.

[1] *Endocrinology*, March-April, 1931.

Abstracts from Current Medical Literature.

PHYSIOLOGY.

The Influence of Sleep, Sleeplessness and Muscular Work on the Blood.

IN view of the relatively small changes that have been observed in the constituents of the blood after considerable lack of sleep, M. Hochrein, J. Michelsen and H. Becker (*Pfluger's Archiv*, November, 1930) decided to investigate the relative stability of the blood equilibria both before and after periods of sleeplessness. Healthy untrained subjects carried out exercise of different grades of severity and their response to similar grades before and after a period of sleeplessness was observed. Lack of sleep caused an increase in the water content of unit volume of blood. The content of chloride and total base and the carbon dioxide combining capacity were increased. Muscular work made evident an increased lability of the equilibria existing in the blood. The variations from the resting values of almost all the factors investigated were greater, so the authors claim, than after a period of sleep.

The Effect of Changes in Oxygen Pressure.

D. B. DILL, H. T. EDWARDS AND A. FOLLING (*Journal of Physiology*, January, 1931) have obtained data relating to the physiological changes occurring at moderate altitudes, namely, 10,000 and 14,000 feet. They find that after complete acclimatization at 10,000 feet and after four days at 14,000 feet the oxygen dissociation curve of human blood has about the same position as at sea level when the hydrogen ion concentration is constant. The carbon dioxide dissociation curve of oxygenated blood is lowered one-tenth at 10,000 feet and slightly more after four days at 14,000 feet. The concentration of chloride in the cells and serum increases slightly, but the ratio between cell and serum chloride is almost unchanged. The ratio of cell bicarbonate to serum bicarbonate increases some 3% at 10,000 feet and rather more at 14,000 feet. It is suggested that this increase may be related to a decrease in the alkaline reserve, since a similar change is found when the alkaline reserve is decreased by exercise. The oxygen gradient from the lungs to the blood remains positive even after acclimatization at 10,000 feet. No evidence of oxygen secretion has been found. The pressure of carbon dioxide in the alveolar air decreases to three-fourths of its sea level value at 10,000 feet and to two-thirds at 14,000 feet. The calculated reaction of arterial serum shows an average increase of 0·03 in pH at 10,000 feet and of 0·08 at 14,000 feet. This change is, however, too small to shift the oxygen dissociation curve of arterial blood outside its normal sea level range. The oxygen transport capacity may be decreased by one-fifth in normal men at an altitude of 10,000 feet. It is suggested that this decrease may be due to the indirect action of a small change in the oxygen saturation of arterial blood upon the limiting value of the cardiac output.

Capillary Blood Pressure in Raynaud's Disease.

USING the method of direct puncture of capillary loops, E. M. Landis (*Heart*, Volume XV, Number 3, 1930) has determined that during a period of spasm in Raynaud's disease the pressure at the summit of a capillary loop is between five and eight millimetres of mercury when the loop is at the level of the sternum. As the arterial spasm relaxes, the capillary pressure rises to reach during the hyperæmia of recovery a value of from 32 to 45 millimetres. The pulse pressure, which is absent in the capillaries during spasm, reaches a value of four or five millimetres during the phase of hyperæmia. A slight swelling of the fingers occurs during recovery. This is ascribed to increased capillary permeability consequent upon the period of oxygen lack. When venous congestion is artificially imposed during the period of spasm the capillary pressure rises slowly, but when such a passive congestion is released the pressure falls rapidly; these phenomena in conjunction show that the spasm is situated on the arterial and not on the venous side of the capillary network.

Intraocular Pressure.

P. M. DUKE-ELDER AND W. S. DUKE-ELDER (*Journal of Physiology*, March, 1931) have continued their investigations into the factors which influence the intraocular pressure. Increase of the colloidal osmotic pressure of the blood plasma caused a fall in the pressure within the eye and conversely the intraocular pressure rose when the concentration of colloids in the blood was diminished, but its total osmotic pressure remained relatively constant. Similar variations in pressure accompanied changes in the osmotic pressure of the plasma crystalloids. The action of osmotic pressure seems to be twofold. There occurs an abstraction from or an addition to the quantity of intraocular fluid as the osmotic pressure of the plasma rises and falls respectively. Duke-Elder has previously shown that this effect can be used clinically to lower the tension in the eye in cases of glaucoma. The effect may last for several days. Osmotic equilibrium must be established long before the end of several days and the prolonged fall in intraocular pressure would seem to indicate physico-chemical changes in the vitreous body, the state of turgescence of which can be diminished by increasing the concentration of salts in the fluid bathing it. Change in the reaction of the blood perfusing the eye, if towards the acid side, caused a fall in tension, but if towards greater alkalinity, a rise in pressure was produced. This was thought to be due in the main to variations in the turgescence of the vitreous. It is suggested that in glaucoma alterations in the metabolism of the vitreous body may cause local change in reaction with resulting increase in turgescence.

The Influence of Posture on Kidney Function.

IT has been known for a considerable time that urine is secreted more rapidly in the recumbent than in the standing posture, and this effect has been ascribed to variations in the general and renal circulations. In 1926 White, Rosen, Fischer and Wood studied the composition of the urine secreted in the different postures, and concluded that their results were incompatible with the filtration-reabsorption theory of renal secretion. Tsang-G. Ni and P. B. Rehberg find that, accompanying the increase in secretion of urine, in the recumbent posture, there is a decrease in the colloid osmotic pressure of the blood plasma. This is due to the recovery by the blood of the water which is lost by filtration into dependent tissues when the recumbent is changed for the erect posture. By determination of the creatinine excretion, changes in the rate of filtration were noted. An increase in the filtration rate almost always accompanied the change to a recumbent posture and might even occur before the diuresis. The diuresis is not accounted for by change in the filtration rate alone, but also by a change in the reabsorption by the tubules. The authors hold that their results can be explained on the basis of the filtration-reabsorption hypothesis.

The Effect of Pitressin on the Heart.

M. GOLDENBERG AND C. J. ROTHBERGER (*Zeitschrift für die gesamte experimentelle Medizin*, April, 1931), in the course of researches into the causation of *angina pectoris* have investigated the effects upon the dog's heart of intravenous injections of pitressin. It is known that pitressin causes a powerful contraction of the coronary arteries similar to the coronary spasm which is considered by many clinicians to be the cause of angina. Consequently the present research concerned itself with the accompaniments of coronary spasm produced by pitressin. It was found that after a temporary rise the blood pressure usually showed a considerable fall. The pressure then slowly rose again and might even exceed its initial level. Since the peripheral vessels were simultaneously constricted by the pitressin, the fall in pressure must be ascribed to cardiac failure as a consequence of the coronary constriction. It was shown that the drug exerted no direct effect on the cardiac muscle. The electrocardiogram showed changes characteristic of cardiac asphyxia. No disturbance of conduction was observed. *Pulsus alternans* and extrasystoles appeared during the rise in pressure subsequent to the initial fall. Fibril-

lation was not observed. The laboratory animals showed no obvious signs of pain during the coronary spasm.

BIOLOGICAL CHEMISTRY.

The Blood Constituents in Acute Rheumatism.

E. M. Hickmans and S. H. Edgar (*Archives of Disease in Childhood*, December, 1930) have investigated the blood urea, non-protein nitrogen and uric acid content of healthy children before and after doses of salicylate, and in rheumatic children before and after treatment. In normal children doses of salicylate up to 1·0 gramme (fifteen grains) three times a day have no effect on the blood urea, and there was no effect on the output of total nitrogen, urea and uric acid through the kidneys. Three patients with acute rheumatism before salicylate treatment was commenced gave blood urea, non-protein nitrogen and uric acid values somewhat higher than the figures obtained for normal children of the same age. The examination of a large number of patients with rheumatism shows that, although salicylate increases the output of total nitrogen, urea and uric acid through the kidneys, and although the blood uric acid is thereby decreased, the blood urea and non-protein nitrogen still remain higher than normal during treatment. The blood phosphorus is also slightly higher than normal. It is suggested that the kidney in rheumatism is unable to deal adequately with these products. The fact that these blood constituents are not increased by salicylate in healthy children suggests that the impairment of renal efficiency is the result of the rheumatic infection rather than the salicylate. On the other hand, some patients with rheumatism showed a higher blood urea after than before salicylates were given; it is thus possible that salicylate may increase to some extent the degree of renal inefficiency.

The Sugar Content of Skin and of Muscle.

H. C. Trimble and B. W. Carey, Junior (*Journal of Biological Chemistry*, March, 1931) have presented data upon the total reducing substance, the non-fermentable material, and the true sugar content of specimens of blood, skin and muscle from non-diabetic and from diabetic patients. Specimens of human skin and muscle were obtained fresh from the operating theatres, and samples of blood were taken at the same time. In the non-diabetic group the true sugar content of the skin and of the muscles averaged respectively 56 and 28 milligrammes *per centum*. In every instance in this group the total reducing substance of the blood was found to be slightly above the normal level as a result of the anæsthesia. With the diabetic individuals the total reducing material of the skin was increased definitely above non-diabetic levels, while the non-fermentable portion was augmented but little; also the total of reducing substances was greater than in the non-diabetic subjects. The averages for the true sugar content of skin and muscle respectively were 144 and 51 milligrammes *per centum*, while the average true sugar of the whole blood was 226 milligrammes *per centum*. The authors regard this as showing that elevation of the sugar concentration in the blood is accompanied by an absolute increase of the quantity of sugar in the skin, while the increase of sugar concentration in muscle is much smaller. The authors note that the results obtained by them are in general agreement with those recently published by Urbach and Sicher. They also show that the sugar content of muscle from diabetics who had received insulin at short intervals averaged almost the same as in the muscle of those who had previously received insulin, but in whom it was no longer believed to be exerting an effect.

Gastric Secretion.

Franklin Hollander and George Cowgill (*Journal of Biological Chemistry*, April, 1931) have planned and carried out experiments to determine whether the concentration of hydrochloric acid in the freshly secreted gastric juice is constant. A method is described whereby accessory stomach pouches in dogs can be provided with sphincters, thus permitting the collection of gastric juice secreted in the absence of a solid collecting device. The authors describe this method as the discontinuous collection technique. The same animals were used for continuous collection experiments. The results obtained confirm the observations of Pavlov regarding the parallelism of acidity and secretory rate for post-prandial gastric secretion in dogs with pouches. When food was replaced by histamine, the same relation held, provided the rate of secretion was not significantly greater than that obtained when food furnished the stimulus. In another series of experiments, when a much higher rate of secretion was induced by histamine, this parallelism disappeared. In this series the acidity rose to a maximum value and remained constant until the rate of flow of juice had again fallen to a low level. With the discontinuous collection method the average acidity was much greater than that found by the continuous collection method, and was practically the same as the values noted after the large doses of histamine. It was also shown that if the retained mucus was washed out of the pouch and the first sample of post-prandial juice was discarded, subsequent samples invariably possessed acidity at or very near the maximum. The maximum acidity values were found to be extremely constant for various dogs under different conditions and to agree with the figures in the literature for cats and human beings. This agreement among the three species is regarded as supporting the view that the unaltered secretion of the parietal cell is isotonic with the blood, the osmotic pressure of which is about the same in all three species, and also the view that the true acidity of this secretion is determined by the osmotic equilibrium of the animal. The deviations from this maximum are ascribed to contamination of the secretion of the parietal cell by that of the mucus-forming and peptic cells. A lymph transudate and epithelial detritus may perhaps play a minor part. The authors advance the view that the chemical mechanisms by which the acidity of the gastric pouch juice is reduced depends upon two factors: (i) a simple dilution by fluids, mucus, peptic secretion *et cetera* containing a large concentration of neutral chlorides, as a result of which acidity is reduced much more than is the total chloride content; (ii) an actual neutralization by the bicarbonate in at least one of the fluids, as a result of which there is a further reduction in total acidity. The authors believe that their results confirm the hypothesis of Heidenhain and Pavlov regarding the constant acidity of the secretion of the parietal cells. They also hold that by demonstrating the possible independence of acidity and rate of secretion, the results present a fundamental incompatibility with the opposing theory of Rosemann.

The Effect of Ingested Urea on Nitrogen Metabolism.

David D. Moore, Paul H. Lavietes, A. Maurice Wakeman and John F. Peters (*Journal of Biological Chemistry*, April, 1931) have carried out experiments on three normal subjects to determine the effect of ingested urea on nitrogen metabolism. Urea was given in doses of thirty-five to fifty-two grammes every day, while the subjects were taking a standard diet. The nitrogen metabolism and the non-protein nitrogen of the blood were determined for periods before, during and after the administration of urea under various circumstances. In every case during the administration of the urea a considerable amount of nitrogen could not be recovered in urine or fæces. The constancy of the fæcal nitrogen throughout the course of each experiment confirmed previous observations that urea is completely absorbed from the alimentary tract. As long as the urea was given the apparent daily retention continued. There was no comparable increase in the non-protein nitrogen of the blood and the experimental data show that up to fifty-two grammes of urea could be given to a normal individual during the course of the day and that this did not appreciably influence the non-protein nitrogen in a specimen of blood taken the following morning. The nitrogen not recovered during periods of urea administration was not swept out in subsequent periods. Data obtained from the analysis of sweat and expired air did not reveal unusually large quantities of nitrogen during urea administration. The experiments did not yield information as to the fate of the lost nitrogen.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE SOUTH AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Adelaide Hospital on May 28, 1931. The meeting took the form of a series of clinical demonstrations.

Derangement of Semilunar Cartilages of the Knee Joint.

DR. P. S. MESSENT showed two patients who were suffering from derangement of the semilunar cartilage of the knee joint.

The first patient was a labourer, aged twenty-four years, who came on March 16, 1931, complaining of clicking in the right knee of two months' duration. The trouble occurred when the joint was flexed. If the patient put weight on the knee while the joint was "out," he had severe pain. He said that on two occasions the knee had become swollen. There was a history of injury to the right knee as a result of falls from a motor bicycle.

On examination there was no swelling of the joint, and the complete range of movements was present. Tenderness was present over the joint line on the lateral side of the patellar tendon. By a combination of complete flexion of the knee and internal rotation of the foot, the patient could be made to feel something slip out of position in the joint. Extension of the knee then became limited, but by wriggling the leg the patient was able to reduce the locking with a click that could be heard and felt, and the movements then became free. A skiagram taken both when the joint was locked and when it was free revealed an increase in the joint space in the outer half of the joint when it was locked.

Dr. Messent's second patient was a labourer aged forty-six years. He came for advice on March 12, 1931, saying that he had had attacks of locking of the right knee for the past two or three months. The patient obtained relief by jerking the knee into extension, and this was associated with a definite click. Attacks were sometimes followed by swelling of the joint and the knee was painful at night. There was no history of injury.

On examination, except for the presence of some effusion into the joint, the findings were exactly similar to those noted with the first patient. No skiagram was taken.

On May 21, 1931, the knee became locked and the patient could not free it. It was so painful that he could not walk and a considerable amount of effusion was present.

Dr. Messent said that these two cases appeared to be examples of displacement of the posterior end of the external and internal semilunar cartilages respectively. In each case the patient had himself discovered the presence of what was described as the test movement for the condition (McMurray's sign).

The test was as follows. The knee was fully flexed until the heel came almost to the buttocks, the foot was grasped with either hand and fully rotated inwards, and the knee was gradually extended in this position. By this means a loose external cartilage could be felt to click between the rotated tibia and femur. Similarly, in examining the posterior end of the internal cartilage, the knee was again fully flexed, the foot rotated out to its extreme limit, and the knee extended with the foot held firmly in this position. This might produce a significant click (Hamilton Bailey). Jones and Lovett in "Orthopædic Surgery" described the condition, calling it "trigger knee," but they stated that it was not limited to lesions of the semilunar cartilage. For example, it had been found due to a semimembranosus tendon slipping over a tibial exostosis.

Fagge, in *The British Journal of Surgery* of October, 1927, mentioned "snapping" knee as indicating a lesion of the posterior end of the external cartilage. He considered the condition extremely rare.

In the cases shown there seemed little doubt that there was a lesion of a semilunar cartilage in each instance, but whether the test would accurately determine the particular cartilage and the end of it affected was beyond Dr. Messent's experience.

Plastic Operation on a Thumb.

SIR HENRY NEWLAND showed a male patient, aged forty years, whose left hand had been crushed by a mine cage on September 13, 1930. The thumb subsequently became gangrenous and separated. There were compound fractures of the second and third and fourth metacarpal bones and a simple fracture of the first metacarpal. After the wound was healed the middle finger lay squeezed forwards between the fore and ring fingers. The little finger alone had any movement. It was decided to use the middle finger to form a thumb. The distal phalanx was removed together with the proximal half of the first phalanx. An incision was made over the metacarpal bone of the thumb and the end of the middle finger was sutured in place. At the time of the meeting the sutures were still in position.

Erythromelalgia and Ramisection.

Sir Henry Newland also showed a male patient who had been subjected to left lumbar ramisection for erythromelalgia. The patient was thirty-five years of age. He was a returned soldier and had lost an arm in the war. He was now a postmaster. For eighteen months prior to seeking advice he complained of pain in his feet. Red blotches appeared on the upper part of the feet and small tender lumps on the soles. The toes and feet became swollen and the patient could not walk any great distance. The pain was worse when he was warm in bed. As all other methods of treatment were without effect, left lumbar ramisection was performed in April, 1931. The left foot showed evidence of sympathetic paralysis, being pinker and warmer than the right. Sir Henry Newland pointed out that since the operation the painful symptoms had disappeared from both feet, so that it was impossible to say whether the sympathetic ramisection had been of any benefit.

Hæmochromatosis.

DR. A. R. SOUTHWOOD showed a man of forty-nine years, a labourer, and formerly a ship's cook. He was of the "thin but wiry" type, and, except for an attack of pneumonia in 1917, had been in good health till August, 1930. He then noticed dryness of the mouth, excessive thirst and increasing bodily weakness. In October he was admitted to hospital. The skin was of a dusky colour. The liver was enlarged, the edge being nine centimetres below the costal margin in the mid-clavicular line. The urine contained much sugar, acetone and diacetic acid. The fasting level of the blood sugar was 0·36 *per centum* and the tolerance curve was of the diabetic type. At this time examination of the skin failed to reveal the presence of hæmosiderin or hæmofuscin. The diagnosis of bronzed diabetes (hæmochromatosis) was made. Diet regulation and insulin injections controlled the glycosuria and reduced the glycæmia to a satisfactory level. The patient was discharged from hospital in November, and he continued treatment by dieting and injections.

In April, 1931, he abandoned adequate treatment. On May 21 he became stuporose and was readmitted to the ward. Glycosuria and ketonuria were present. He quickly responded to treatment. The patient at this time presented the characteristic signs of bronzed diabetes: (i) Pigmentation of the skin. As usually seen in these cases, the colour was slaty rather than bronze. Recent examination of the skin showed the presence of the iron-containing hæmosiderin. (ii) Liver enlargement. The bromsulphalein test revealed deficiency of hepatic function. (iii) Glycosuria and polyuria.

Dr. Southwood stated that the diabetic signs were responsive to the usual antidiabetic *régime*. The hepatic cirrhosis, associated with the abnormal deposition of iron-containing pigment in the liver, was a progressive condition and not amenable to treatment.

Albinism.

Dr. Southwood also demonstrated a typical case of complete albinism. The patient was a man of forty-four

years. A brother and a sister were also albinos, but the parents and four other children were normal. There was absence of pigment from the skin, hair and irides. The man presented a striking contrast to the patient suffering from bronzed diabetes: the latter's skin was excessively and abnormally pigmented. The albino presented the characteristic eye signs, photophobia, nystagmus and nyctalopia.

Deformity of the Knee.

DR. L. O. BETTS showed a man, aged thirty-four years, who had suffered with a flexion deformity of the knee since three years of age, following a septic arthritis. For the last fifteen years he had walked on a stool crutch strapped to his thigh. The knee had been flexed to an angle of 65°, and the skiagram showed absolute bony continuity of tibia and femur. By two operations on bones and soft structures, at intervals, the limb was straightened by skeletal traction. The limb was now firm with 7·5 centimetres (three inches) of shortening, but good function. The interesting feature of the case was that the hip joint had extended without any trouble, and that the patient walked without any sign of flexion deformity at the joint.

Injury to the Astragalus.

Two specimens were also shown by Dr. Betts. The first was an astragalus removed from an adult after an aeroplane crash. The astragalus had been fractured through the neck and the body of it dislocated backwards behind the inner malleolus and rotated outwards through 90°. It was connected to the *os calcis* only by the posterior capsule of the subastragaloid joint. Astragalectomy was performed. The foot could not be moved backwards at this operation owing to the brawniness of the tissues, so a second operation was needed four weeks later. With seven months in plaster, followed by wearing a boot with short side irons, the man was able to carry on active work as a station overseer, fourteen months afterwards. He then had 5° of dorsiflexion and 10° of plantar flexion, and a plantigrade foot. He could stand on his toes and had played tennis. He now wore his side irons only for heavy work.

The second specimen was from a patient with a fractured astragalus. It was from a boy thirteen years of age who had fractured the neck of his astragalus six years previously. It gave no trouble until recently, when he complained of recurrent attacks of aching and swelling on the antero-external part of the ankle joint. On examination this part was a little puffy, and there was slight tenderness over the antero-external edge of the articular surface of the astragalus. An anchored loose body could be felt here. The joint was otherwise normal.

On X ray examination osteo-chrondritic changes were seen over the whole of the outer articular surface and a little across anterior of the astragalus. It appeared as if there might be a loose flake of bone, and the general appearance was like that of an *osteochondritis dissecans*.

Arthrotomy was performed and a piece of cartilage was removed. This was 2·5 centimetres (one inch) long by 6·0 millimetres (a quarter of an inch) through, attached loosely by fibrous tissue in front and by healthy articular cartilage behind. It was really the whole of the upper outer angular edge of the articular surface of the astragalus, which had apparently split off when the neck was fractured six years previously, remaining attached by the posterior end. A small piece of bone was included in the anterior end of the fragment. This half of it was the movable part that had given trouble.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Saint Vincent's Hospital, Melbourne, on June 17, 1931. The meeting took the form of a series of clinical demonstrations.

Arthroplasty of the Knee.

DR. H. B. DEVINE showed a patient on whom an arthroplasty of the knee joint had been performed a month previously. The arthroplasty had been carried out by an original method, by which the crucial ligaments and the lateral ligaments of the joint were left intact and free fat and fascial flaps were used. In this way a knee joint was obtained which was not so freely movable as that which resulted when ordinary methods were used—there was a moderate range of flexion and extension. There was no, or very little, lateral movement, and this gave a stable knee joint.

In this particular patient the knee had been ankylosed in a position of flexion for years, and Dr. Devine demonstrated how Kirschner's method of wire traction could be used to produce the very strong and continuous extension which was necessary to make as big a gap as possible between the joint surfaces and to elongate the contracted flexed muscles.

Complete Heart Block.

DR. A. E. ROWDEN WHITE demonstrated a case of complete heart block. The patient was an old gentleman, aged eighty-two years, whose health had been satisfactory until nine months previously, when he commenced to develop giddy attacks and would at times fall down in the street, but with no loss of consciousness. Breathlessness on exertion had been observed only recently, and there was no accompaniment of precordial pain or any other discomfort. He was quite free of any dropsical swelling. Several yards of electrocardiograms were demonstrated, which revealed interesting changes in the conducting mechanism and the myocardium. In addition to the complete disorientation of function of auricle and ventricle, there were ectopic *P* waves, a pronounced right bundle lesion and irregular types of both right and left premature ventricular beats. He had experienced two Stokes-Adams attacks of prolonged character. In the first attack in October, 1930, his medical attendant had him under close observation for several hours, and his pulse rate averaged 14 per minute. The second attack occurred on his admission to hospital on June 4, 1931. The pulse rate, recorded at frequent intervals, varied between 28 and 40.

Abscess of the Lung.

The second patient shown by Dr. Rowden White was suffering from a pulmonary abscess of the middle lobe treated by artificial pneumothorax. The abscess was probably embolic in origin, following extraction of septic teeth a few months before. The progress of the method of artificial pneumothorax was well illustrated by a series of X ray films.

Selective Pulmonary Collapse.

DR. W. J. NEWING described a case of selective pulmonary collapse. The patient, a woman aged fifty-five years, had presented herself four years previously with a very large tuberculous cavity in the upper lobe of the right lung, subclavicular in position. The left lung showed no indication of disease. Compression was effected on the right side, but the only portion of the lung that collapsed was the diseased area; extensive adhesions at the apex and base prevented collapse in those positions. Under the circumstances it was possible to produce very high pressures in this limited pleural space without distressing the patient and the cavity was successfully flattened out. The cough and sputum rapidly cleared. The compression was kept up for two years and at the time of the meeting it was two years since the lung had been allowed to reexpand. There was a dense scar in the position of the old cavity. The patient had quite recovered her health.

Pulmonary Tuberculosis.

Dr. Newing's second patient was a woman, aged thirty-seven years, who nine years previously had been in a sanatorium with active tuberculosis. She apparently recovered and had since married and reared two children.

Lately she returned with cough, almost an ounce of sputum daily, loss of weight *et cetera*. Although it had not been possible to find bacilli in the sputum, Dr. Newing regarded her condition as definite recurrence. The interest-

ing point was that radiologically she showed no sign of activity. There was a typical Gohn's tubercle in the middle of the right upper lobe.

Diabetes Insipidus.

Dr. Newing's third patient was a man, aged forty-two, who had been under observation for five years with *diabetes insipidus*. At the outset he had presented large areas of decalcification in the membranous bones of the skull, the so-called Christian's syndrome.

Contrary to general teaching, dry pituitary extract, given in sufficient doses, 0·6 gramme (ten grains) three times a day, had produced a very appreciable result in reducing the quantity of urine, but had no permanent effect; it was discontinued after two years. However, the skull deficiencies were now no longer to be seen. The polyuria was unaltered.

Myocardial Infarction and Angina.

Dr. J. W. Grieve showed a man, aged forty-five years, who complained of attacks of precordial pain each day for the past month. His initial attack occurred whilst at work and was associated with pain under the sternum and down the left arm. It was not very severe and lasted only a few minutes. There apparently was no shock or dyspnœa. After that he had frequent attacks of similar type, but more severe. All were associated with exertion.

His previous history was good except for alcoholic excesses till two years before. Examination revealed pallor, pyorrhœa and some thickening of the blood vessels. The systolic blood pressure was 150 and the diastolic pressure 80 millimetres of mercury, but no other abnormality was present. His blood serum did not react to the Wasserman test, and the X ray appearances of the heart and aorta were within the limits of normality. His electrocardiogram showed depression of the *S-T* interval, which curved into a sharply inverted *T*. There were very high voltage *T* waves in leads II and III. Dr. Grieve said that these findings were indicative of coronary disease. He showed the patient from the standpoint of the ætiology and possible pathology of his condition. It seemed probable that an initial cardiac infarction occurred with subsequent anginal attacks.

Friedreich's Ataxia.

Dr. Grieve's second patient was a boy, aged thirteen years, who had whooping cough at the age of five years. He had seemed delicate afterwards, but nothing definite was observed till twelve months later, when he developed difficulty in walking, the abnormality being more pronounced on the left side. This progressed, and at the time of demonstration he was very ataxic.

Examination revealed pallor, curious jerky movements of the limbs, not unlike choreiform movements, and gross ataxia. He walked with a wide base, with his eyes fixed on the ground in front of him. He brought his feet down heavily. His ataxia was worse with his eyes shut. His voluntary movements were rather jerky and incoordinate. His speech showed a lack of rhythm and regularity of utterance. His deep reflexes were absent. The plantar reflexes were extensor in type and a slight *pes cavus* was present. Scoliosis was developing. Slight nystagmoid movements of the eyes were observed on lateral deviation. His eye grounds revealed no abnormality. His blood gave no reaction to the Wassermann test.

Dr. Grieve pointed out that the patient had been under observation for several years, and during the past twelve months his condition had become much more definite. There was no familial history. The patient was shown as an example of what appeared to be a fairly typical example of the ataxia first described by Friedreich.

Oxycephaly.

Dr. Grieve's third patient was a girl of sixteen years. She gave a history of five *petit mal* attacks in infancy. At the age of two and a half years swellings were noticed in the region of the anterior and posterior fontanelles. The posterior swelling pulsated for six months. During this time she had frequent severe headaches which were associated with screaming. These at times necessitated the administration of morphine. At the age of four years it was observed that she had a double secondary optic atrophy and she lost the vision in her left eye. After that time her headaches steadily decreased and at the time of the meeting she rarely suffered from them. Despite the ophthalmoscopic appearance of the right disc, she had complete vision in the right eye.

Examination revealed an abnormally tall, broad head with narrow antero-posterior diameter. Her forehead was vertical and the bregma region formed the vertex of the skull. Both the anterior and posterior fontanelle regions presented a bony prominence.

Exophthalmos was present with slight obliquity of the eyes, the outer canthus being lower than the medial. The left pupil did not react to light. The fundi presented the typical appearance of secondary optic atrophy. Slight nystagmus was present.

The facial appearance resembled that of chronic nasal obstruction, due to depression of the maxillæ. The palate was high and narrow, with crowding of the teeth. The patient's mentality was moderately good, despite the absence of schooling.

X ray examination revealed the typical characteristics of oxycephaly with well marked digital markings due to the increased intracranial pressure. No suture lines were present. The *sella turcica* was a normal size and was well defined.

Dr. Grieve pointed out that the condition was due to: (i) The premature synostosis of the bones of the skull and face. Where the bones met, they fused. (ii) The fundamental deformity of the great wing of the sphenoid, which was abnormally large and solid. This deformity pushed the temporal bone laterally and increased the transverse diameter and also produced the shallow wide orbits. To adapt itself the base of the skull was cramped from before backwards and therefore had to increase in height.

Pseudo-Hypertrophic Muscular Dystrophy.

Dr. Grieve's fourth patient was a boy, aged twelve years. He had developed well until the age of five years, except that walking was stated to have been retarded by an attack of colitis, and he did not commence to walk until the age of two years. At the age of five years it was observed that he stumbled a great deal and walked with a waddle. He had difficulty in negotiating stairs, and, according to his history, climbed up his legs in assuming an erect position. The condition progressed, and at the age of ten years he was unable to walk. Since that time he had been wheeled about in a chair. During this period he developed contractures in ankles, knees and hips.

He was the third of three children. The other two were girls, older than he and quite well. There was no other family history of note.

Examination revealed characteristic features of an advanced pseudo-hypertrophic muscular dystrophy. (i) Hypertrophied calves and glutei and also to a slight extent deltoids; (ii) marked wasting of other muscles; (iii) general weakness; (iv) tendency to slip through the hands when an attempt was made to lift the patient under the axillæ; (v) absent deep reflexes; (vi) contractures of hips, knees, *tendo Achillis*; (vii) electrical reactions—diminished response, but still present.

Dr. Grieve showed the patient from the standpoint of the persistence of gross pseudo-hypertrophy despite the fact that the disease had progressed to an advanced stage. The hypertrophy of the deltoid muscles also was an interesting feature.

Myasthenia Gravis.

Dr. John F. Williams presented a case of mild *myasthenia gravis* in a young woman, aged twenty-nine, married, with two children. She complained that for the past four years on and off she had been suffering from "nerves," being tired, depressed, irritable and emotional, with frequent headaches. During the same period she

complained of attacks of double vision, and the right eyelid had completely dropped at times. During the past six months she had been complaining that she was tongue-tied, with difficulty in swallowing fluids, which at times came up at the back of her nose, and speech at times was slurred and indistinct. For the same period her right arm had been becoming weak and clumsy, with feelings of numbness, sufficient to interfere with her housework, but especially with her ability to play the piano. There had been periods when the symptoms were much more marked, followed by periods of comparative freedom. These symptoms were always more marked towards the evening following a heavy day. She had been regarded by her husband and relatives as nervous, and was strongly suspected of malingering, and for this and other reasons there was a great deal of domestic unhappiness. Dating from her first confinement there was a gynæcological history of cystocele, cervical erosion, retroversion, incontinence of urine and some vaginal discharge, for which treatment had been instituted. Family history revealed nothing of note, though one brother had died of tuberculosis. The Wassermann test gave no reaction, and a section of muscle from the right extensors of the wrist showed no lymphorrhages, but some œdema of the muscle fibres was present. Clinical examination showed some weakness in extension of the wrists, the right more than the left, but the reflexes were normal and sensation was unimpaired. Cranial nerves showed slight right ptosis and she complained of diplopia on looking to the extreme right or left sides. The heart condition seemed normal. The systolic blood pressure was 135 and the diastolic pressure 80 millimetres of mercury. The lungs were normal and the abdomen was normal. The electric reactions had not yet been taken, but a diagnosis of *myasthenia gravis* seemed fairly obvious.

Post-Encephalitic Parkinsonism.

Dr. Williams presented two cases of post-encephalitic Parkinsonism, illustrating the difficulties of diagnosis of the original attack. In one case, that of a youth, aged nineteen years, there was a history that, in 1924, double vision had been noticed for one week, though the patient continued at school. Then in 1926 there had been an illness apparently resembling chorea, during which the patient was away from school for six months, but not confined to bed. This was followed by freedom from symptoms until 1930, when shaking of the right arm and leg was noticed.

In the second case, that of a man, aged twenty-three years, there had been a nervous attack in 1923, during which the patient was delirious for three days, but other details could not be obtained. Since then the patient had been getting gradually slower in his movements and had been discharged from various positions because of this. In spite of this, the patient was able to run with the harriers, and could run one hundred yards in ten and three-fifths seconds.

Both patients showed typical Parkinsonian symptoms, mainly unilateral.

NOMINATIONS AND ELECTIONS.

The undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

Shorter, Alan Ashton, M.B., 1930 (Univ. Sydney), 133, Middle Harbour Road, Lindfield.

The undermentioned has been elected a member of the Victorian Branch of the British Medical Association:

Dorman, John Herbert, M.B., B.S., 1931 (Univ. Melbourne), Wagga District Hospital, Wagga, New South Wales.

Australasian Medical Publishing Company, Limited.

ANNUAL MEETING.

The annual meeting of the Australasian Medical Publishing Company, Limited, was held at The Printing House, Seamer Street, Glebe, on September 23, 1931, Dr. T. W. Lipscomb, the Chairman, in the chair.

Directors' Report.

The Directors submit their report for the past year and the balance sheet as at June 30, 1931, together with the profit and loss account for the twelve months ended June 30, 1931.

The arrangements for carrying on the work of The Medical Journal of Australia and of The Printing House, made after the death of Dr H. W. Armit, and mentioned in our last report, have been justified, due mainly to the continued efforts of Dr. Mervyn Archdall in the editorial department and Mr. A. Simpson in the printing and publishing department.

During the twelve months there has been little, if any, improvement in the economic and financial position of the Commonwealth, and it is gratifying to note that, despite this and the imposition of increased taxation, the transactions of the Company, after providing for debenture interest, have again resulted in a small surplus.

The Medical Journal of Australia has retained its popularity and position among the foremost scientific publications of the world.

The bank (1923, £5,000) overdraft has steadily been reduced, at a rate which will bring about its extinction in the next few years.

Leave of absence was granted to the Secretary, Dr. R. H. Todd, in April, 1931, and Mr. J. Noldt was appointed Acting Secretary.

As a result of the year's successful work the Directors have been enabled to authorize the payment of a portion of the arrears of debenture interest.

Dr. T. W. Lipscomb and Dr. R. H. Fetherston retire from office by rotation, in accordance with the Articles of Association (Article 39). They are eligible and present themselves for reelection.

(*Signed*) T. W. Lipscomb,
Chairman.

Election of Directors.

Dr. T. W. Lipscomb and Dr. R. H. Fetherston were reelected to the Board of Directors.

Obituary.

WILLIAM JOHN HANCOCK.

We regret to announce the death of Dr. William John Hancock, which occurred in London on September 2, 1931.

Hancock was born in Dublin in 1863 and received his early scientific training at the University of Glasgow, where he studied under his uncle, Professor James Thompson, Professor of Engineering, and the late Lord Kelvin, then Sir William Thompson, Professor of Natural Philosophy.

He came to Western Australia in 1885 to enter the Government service of the colony. Immediately following the discovery of the X rays by Röntgen in 1895, Hancock realized the importance of their application and obtained the necessary equipment from London in 1896. In 1898 he was appointed Honorary Radiologist to the Perth Hospital, which position he occupied for twenty-two years, when he was appointed Honorary Consulting Radiologist, occupying the position until his death. During the war years he directed in an honorary capacity the radiological work of the Base Hospital at Fremantle.

In recognition of his contribution to science, and especially his meritorious work in the field of radiology, the Royal Society of Western Australia conferred on him the Society's first Kelvin Medal, and later the honorary degree of Doctor of Science was conferred on him by the University of Western Australia. He was a member of the Institute of Civil Engineers, of the Institute of Electrical Engineers, of the Röntgen Society of London and of the British Association of Radiology.

In recognition of his pioneer work in radiology and his services to the medical profession in that State, the Western Australian Branch of the British Medical Association created him an honorary life member of the Association.

Like many other scientists working in the realm of radiology, Dr. Hancock had to pay the price of his gifts and enthusiasm, for he became the subject of the dread disease which has claimed other X ray workers, and lost the use of the fingers of one hand and partially the use of those of the other.

His early recognition of the value of radiography made this valuable diagnostic and therapeutic aid available to the profession and public of Western Australia, and the profession has to thank one who, although not a member, rendered it conspicuous service.

Dr. A. Syme Johnson writes:

A notable West Australian has died. For many years W. J. Hancock was chief electrical engineer for this State, but the life he lived was such that his medical colleagues regarded him rather as one of themselves than as a member of the engineering profession.

H was a true pioneer of radiology, and imported the necessary appliances within a few months of Röntgen's great discovery.

Very shortly followed the service which endeared him to the medical profession. He erected his apparatus in a small room at the Perth Hospital, and there for twenty years he devoted both plant and time to the needs of the sick. During all those years there was no other X ray apparatus in Western Australia, and Hancock ungrudgingly gave, as it seemed to us who knew him, everything of time and care and patience to this art that might have been asked of some well-to-do man of independent means, instead of a busy engineer who had done a day's work before he turned to his labour of love at the hospital.

The future was to show us that he was giving even more—his life. In the later years of this work he developed that intractable epitheliomatous degeneration of the skin which affected so many of the early workers.

The existing forms of appliances were few and not trustworthy, and the pioneers were accustomed to estimate the working state of this primitive plant by holding up their own hands before a screen. This continual exposure was to prove a fatal procedure, and almost all of our pioneers died of the sad results of this habit.

The writer had his first practical tuition in X ray work under Hancock, just twenty years ago. The time spent with him each week had a double benefit in the increasing knowledge of a fine character, no less than the lucid tuition he so willingly gave.

In later years honours came thick upon him. An honorary doctorate of science, membership of several learned societies, and a life pension from the Government when he was at last prevented from carrying on by his increasing manual disability.

One always likes to think that the man himself, from his very nature, valued not least what was the last of his honours, namely, the membership of the Western Australian Branch of the British Medical Association. It was conferred in affectionate admiration of the man and his work, and as such he valued it.

JOHN KENNY.

We regret to announce the death of Dr. John Kenny, which occurred on September 14, 1931, at Esperance, Western Australia.

Correspondence.

TRACHOMA AND DIET.

Sir: My experience supports the view that trachoma is not highly contagious, though considered to be so by English and American observers. At Lemnos, with innumerable flies, and with numbers of Egyptians suffering from trachoma, none of our troops or hospital patients acquired trachoma. In Egypt the same obtained. I saw no case of trachoma among troops at Lemnos nor at Abbassia who had not suffered from trachoma prior to enlistment. For many years at our Brisbane Hospital for Sick Children I always had several severe trachoma cases in the eye ward. They were not isolated and not once was the affection contracted by any other child in the ward. It seems necessary to assume, as Sir James Barrett does, a contributing agent, a "missing factor" other than or in addition to contagion. I would suggest that trachoma is largely or primarily a food deficiency disease. That it is apt to attack those who have insufficient vitamin *A* in their diets. It is prevalent in our western (sheep) districts, where milk and butter and green vegetables are apt to be scarce; and in those districts it is rare in families who are careful to and able to insure sufficiency of these articles of diet. It also occurs in many members of the same household, who may be supposed to suffer from the same deficiencies.

The irritation caused by flies and by what flies carry may act in causing trachoma only when vitamin deficiency predisposes to the affection. There is, of course, a vitamin deficiency due to fads and habits as well as to lack of supply. Unsatisfactory emigrants also bring their habits with them.

A. F. MacCallan,[1] whose experience of trachoma in Egypt is so great, does not mention the possible factor of diet deficiency in his recent exhaustive paper, neither does Bishop Harman.[2]

Vitamin *A* is deficient as a rule in the diet of Egyptians and Chinese children and adults. I am making the suggestion because it may be possible for medical men practising in districts where trachoma is prevalent, to put it to the proof by instituting prophylaxis, especially in the case of young children. Those of us practising in cities see cases only after they have become established.

Is the diminished prevalence of trachoma in Australia, in districts where it is still common, a result of better diet for children and adults? I have heard of no explanation which appears to me to be as plausible as this last. We are only on the fringe of our knowledge of what vitamins can do, and of what harm their absence can cause. McCollum,[3] McCarrison[4] and a host of others are doing their best to discover and teach us. Are we seeing trachoma cases "whole" if we omit the food factor part of their environment.

Yours, etc.,

J. Lockhart Gibson.
M.D. (Edin.), F.R.A.C.S.

Brisbane,
September 15, 1931.

References.

(1) A. F. MacCallan: *British Journal of Ophthalmology*, July 31, 1931.
(2) Bishop Harman: *The British Medical Journal*, September 20, 1930.
(3) E. V. McCollum: "The Newer Knowledge of Nutrition."
(4) Robert McCarrison: *The British Medical Journal*, June 13, 1931.

SNAKE-BITE.

Sir: In examining practitioners, nurses and first aid students, I have noted that the belief is very widely held that, should a snake-bitten person show signs of drowsiness, he must forcibly be kept awake. This procedure seems to me ungrounded on physiological fact, and in fact harmful. It is probably a survival of some mediæval method of treatment and has perhaps been bolstered up

in the minds of some of our own profession by the careless thinking implied in: "But the neurotoxic element of the venom must be combated."

In the text books this *furor agendi* receives no support: In "Choyce," in "Rose and Carless," in "Price" and in the first aid manuals of Warwick and Tunstall and of the Saint John's Association, it is not mentioned, while in Hutchinson and Sherren's "Index of Treatment" Simple writes very definitely against it.

I would be interested to have the views of others on the subject.

Yours, etc.,

Alfred Jacobs.

Harvey,
Western Australia,
September 7, 1931.

ACCOMMODATION IN ANIMALS.

Sir: Professor Osborne's most interesting sketch of the various methods by which animals accommodate, read in conjunction with the Bancroft Lecture of Professor Wood Jones, should force people who have not already done so to revise their ideas on the subject of the evolution of animals. As Professor Osborne points out, we are presented with some half a dozen different methods by which animals accommodate. But even this statement does not tell the whole of the story. In mammals below the primates accommodation is rudimentary and practically useless and assumes importance, and indeed existence, only when we reach the monkeys. Furthermore, according to Theodore Beer, two methods are employed by the snakes. In one group the lens is moved, in the other the curvature of the lens varies. It is therefore evident that as regards accommodation there has been no gradual orderly evolution, but a set of abrupt changes in design almost suggesting, as Professor Osborne puts it, the method of trial and error.

If a speculator suggests that an intelligence of anthropomorphic type superintended the process, we should say that the technical knowledge displayed was not of a high order.

Indeed, Helmholtz long ago drew attention to the defects of the human eye which no competent craftsman would have tolerated, though he added the human eye was good enough for him. Special creation on the grounds already stated is inconceivable.

I prefer, however, in face of such an amazing set of facts not to speculate, but to realize that I am unable to even conjecture how such mechanism came into being.

Like so many other biological problems, that of accommodation is beyond me altogether, and an explanation seems out of the question.

Jeans, Edington and the cosmic physicists may conceive of a physical universe which is changing in an orderly and definite manner, though they are not in complete agreement with one another, but in this small part of the biological field I fancy that even they would give up the attempt as hopeless and beyond human comprehension.

Of the evolution of this and similar mechanisms, such as the cochlea, there is abundant evidence furnished by comparative investigation, but of the method and cause of that evolution there appears to me to be no indication whatsoever. Ignoramus.

Yours, etc.,

James W. Barrett.

103-105, Collins Street,
Melbourne,
September 21, 1931.

ORTHOPÆDIC SURGEONS.

Sir: In your issue of September 12 Dr. John Hoets has condemned some remarks of mine on orthopædists' treatment of back pain attributed to injury in worker's compensation cases. If my remarks were in bad taste, and they were certainly too general, I wish to apologize. But at the same time I want to say that as a consequence of cases I have seen, I feel strongly, and I had a corresponding wish to express myself strongly. I put it as I did because such rhetorical expedients are a sure means of causing people to take notice, and I wanted notice to be taken. It was not from a desire to hurt anyone's feelings, and it was not an agreeable task to me, but a quiet life is not everything. The usual passing of bouquets to one another at medical meetings is very pleasing, though it is not always sincere, and we know it is not.

Dr. Hoets has made some little additional criticism which shows how he looks at things, for his opinion is that I have shown a lamentable ignorance of orthopædic principles. No, it is not exactly that. I would put it, rather, that I am somewhat disposed to scepticism, sometimes even more than that, or as some would say (perhaps Dr. Hoets), worse than that.

Now, about those "principles." If we can but unbandage our eyes and look, we find that in reality they are empirical formulas. They belong to human opinion. They may be right and wise, but not necessarily so, and they may be open to improvement. No one should expect us to accept them without question, without qualification, and without criticism. Who does not know that in the past our profession has made idols of such things? It has worshipped authority and tradition (it still does it), and followed formulas as its gods. For instance, purging and bleeding. It was the rise and success of homœopathy that undid these particular gods.

Homœopathy has had its day and done its work. Other cults have arisen. Now, would not some of our worker's compensation cases, especially those with pain in the back, do better in the hands of faith healers, New Thoughtists, and Christian Scientists than in the hands of practitioners piously devoted to certain formulas, *alias* principles, orthopædic or otherwise? I know, of course, that the unorthodox practitioners also use empirical formulas (which they, too, call principles), and that they use them uncritically and indiscriminatingly. But they do try to build up the personality, they build up courage and the will, and they succeed remarkably and notoriously—sometimes.

The insured man with a "bad back" begins with a serious psychological handicap that is not of his own making. Too often is such a man put into fixation apparatus—a plaster jacket, or the like—and thereby is created one more example of a man bound and enslaved to a vicious circle from which escape is difficult. If it is bad taste to say that this is ruination, when one believes it is, then one can plead extenuating circumstances. And if others are not making the same comments at medical meetings, they are certainly saying it privately, which keeps things smoother, but is not dynamic.

Yours, etc.,

C. E. Corlette.

Sydney,
September 21, 1931.

PUERPERAL SEPSIS.

Sir: I was very interested in Dr. Edward R. White's address on puerperal sepsis in The Medical Journal of Australia of September 19, 1931. If I may be permitted to offer comment, I should like to amplify his reference to Dr. Remington Hobbs, and correct it as to details of treatment.

During 1930 and 1931 I was working under Hobbs at Saint Mary Abbot's Hospital, London, and for six months had charge of the maternity unit. The technique employed is to use 100 cubic centimetres of glycerine at each treatment, the method depending largely on the time taken (that is, slow injection) and the frequency of treatment.

Very severe cases are treated as often as every three or four hours, milder cases less frequently, but the full amount of 100 cubic centimetres of glycerine is used at each treatment.

Combined with correct postural drainage and attention to all details of general treatment, such as fresh air, food, good nursing *et cetera*, this treatment meets with

extraordinary success. I feel that if the lines laid down by Hobbs were followed more closely our results in this terrible complication of the puerperium would improve considerably.

Yours, etc.,

H. M. Fisher.

188, North Terrace,
Adelaide,
September 23, 1931.

Proceedings of the Australian Medical Boards.

TASMANIA.

The undermentioned has been registered under the provisions of the *Medical Act*, 1918, of Tasmania, as a duly qualified medical practitioner:

Maxwell, Alexander Henry Meyler, L.R.C.S., L.R.C.P. (Edinburgh), L.F.P.S., 1908 (Glasgow), F.R.C.S., 1910 (Edinburgh), Richmond, Victoria.

NOTICE.

The Beattie Smith Lectures for 1931 will be delivered in the Medical Society Hall, East Melbourne, on Monday, October 19, and Tuesday, October 22, 1931, at 8.15 o'clock p.m. The subject of the lectures will be "Treatment of Insanity by the General Practitioner." The subject will be treated purely from the standpoint of the general practitioner. It is hoped that a large number of medical practitioners will attend.

Diary for the Month.

Oct. 13.—New South Wales Branch, B.M.A.: Ethics Committee.
Oct. 20.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
Oct. 23.—Queensland Branch, B.M.A.: Council.
Oct. 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.
Oct. 28.—Victorian Branch, B.M.A.: Council.
Oct. 29.—South Australian Branch, B.M.A.: Branch.
Oct. 29.—New South Wales Branch, B.M.A.: Branch.
Nov. 3.—New South Wales Branch, B.M.A.: Organization and Science Committee.
Nov. 5.—South Australian Branch, B.M.A.: Council.
Nov. 6.—Queensland Branch, B.M.A.: Branch.
Nov. 10.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments.

Dr. H. M. Rees (B.M.A.) has been appointed a member of the Medical Board of Port Pirie, South Australia, pursuant to the provisions of the *Workers' Compensation Act Amendment Act*, 1927.

* * *

Dr. B. M. Carruthers has been appointed an Official Visitor to the Mental Diseases Hospital, New Norfolk, Tasmania, under the provisions of the *Insane Persons' Hospital Amendment Act*, 1885.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xii.

Adelaide Children's Hospital (Incorporated), South Australia: Medical Superintendent.

The Brisbane and South Coast Hospitals Board, Queensland: Honorary Out-Patients' Physician.

Medical Appointments: Important Notice.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
New South Wales: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phœnix Mutual Provident Society.
Victorian: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
Queensland: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members desiring to accept appointment in ANY COUNTRY HOSPITAL, are advised to submit a copy of their agreement to the Council before signing, in their own interests. Brisbane Associated Friendly Societies' Medical Institute. Mount Isa Mines. Toowoomba Associated Friendly Societies' Medical Institute.
South Australian: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
Western Australian: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
New Zealand (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to The Medical Journal of Australia alone, unless the contrary be stated.

All communications should be addressed to "The Editor," The Medical Journal of Australia, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Subscription Rates.—Medical students and others not receiving The Medical Journal of Australia in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.